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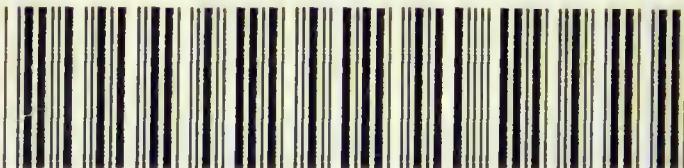
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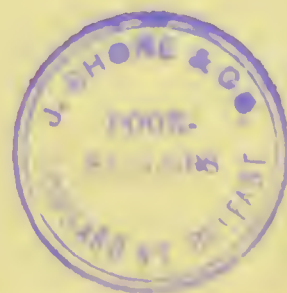
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ELEMENTS
OF
PHARMACY, MATERIA MEDICA,
AND
THERAPEUTICS.

WM. STRAIN AND SONS,
PRINTERS,
GREAT VICTORIA STREET, BELFAST;
AND
103, HATTON GARDEN, LONDON.

ELEMENTS OF
PHARMACY,
MATERIA MEDICA,
AND
THERAPEUTICS.

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ETC., ETC., ETC.

With Lithographs and Woodcuts.

SIXTH EDITION.

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T. LAUDER BRUNTON, M.D., D.Sc., F.R.S.,

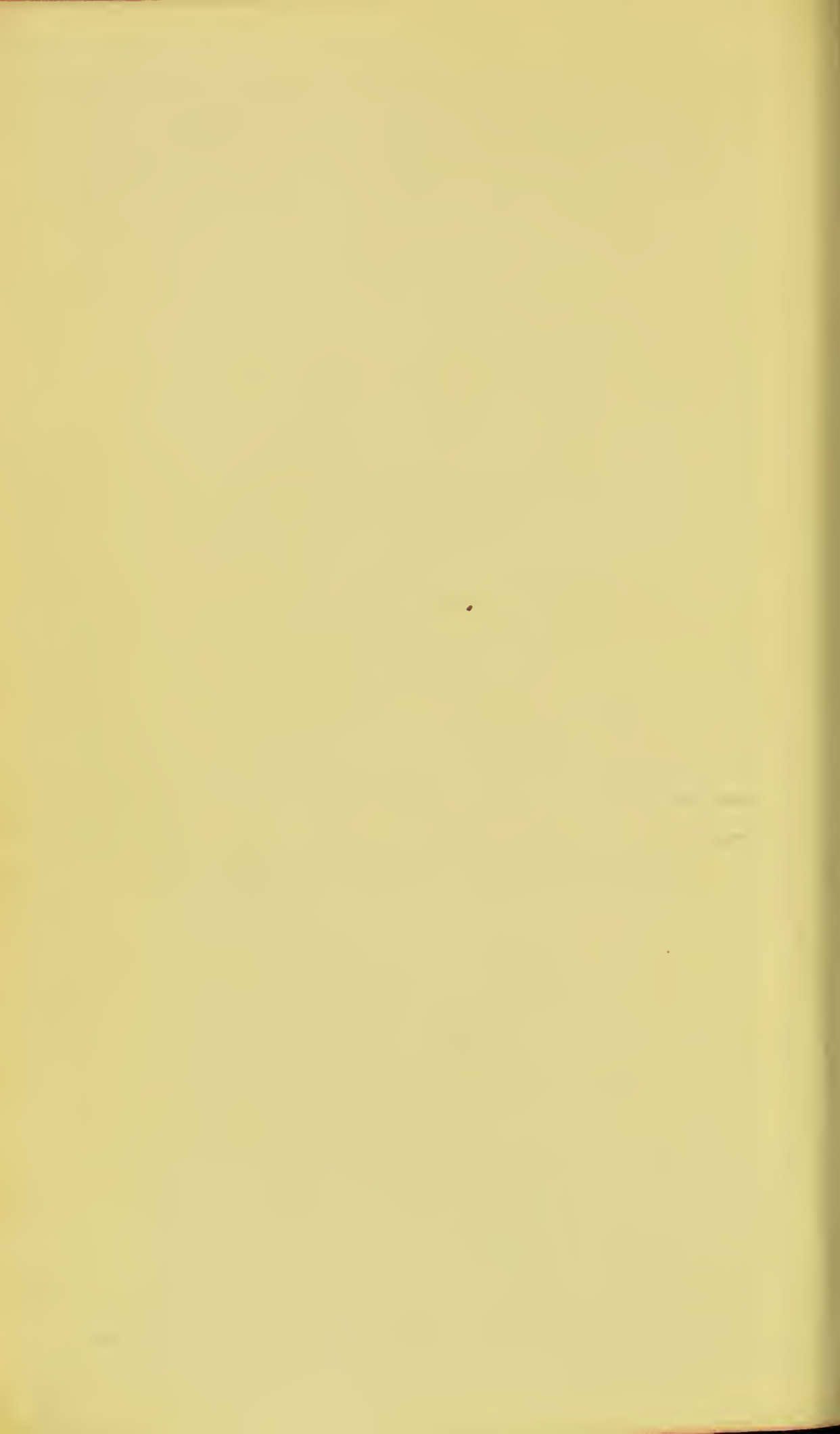
WHOSE BRILLIANT DISCOVERIES AND ORIGINAL
RESEARCHES

HAVE ILLUMINATED THE FIELDS OF
PHARMACOLOGY AND THERAPEUTICS,

This Volume is respectfully Dedicated

BY HIS FRIEND,

THE AUTHOR..



PREFACE TO THE FIRST EDITION.

THE aim of this little work is to give to the student of medicine such information in a concise form as he generally has to sift out of two or more of the larger manuals. So many valuable volumes have been written on *Materia Medica* and *Therapeutics* as to leave little necessity for another ; but it is not the intention of the writer to presume that this work will take the place of any of them, the question of space necessitating the knowledge being given to the reader often in a very fragmentary condition.

The arrangement of the subject, which has been sanctioned by custom, has been departed from, the work being divided into distinct and separate sections, and the drugs arranged alphabetically. The writer found that most students, in grappling with *Materia Medica*, generally read the *Therapeutics* of each remedy once or twice over, while its preparations had to be committed to memory. Thus, a process of confused selection always distracted, and prevented that clear view of each detail so necessary to ensure a thorough grasp of every branch of the subject. Many students, too, have already mastered the chemistry of each drug in the laboratory, and hence to such, an arrangement like the one adopted will probably be beneficial; whilst to those who have not, the condensed bird's-eye view of the subject may be appreciated. The writer is satisfied that this plan is open to serious objection, as is the most generally followed one, but he hopes that it may assist the already over-taxed student, who often fails to get any idea of the subject at all if the matter be not placed in a condensed form within his reach.

Actuated by the feeling that *Pharmacy* is one of the most important sections of *Materia Medica*, he has laboured to put this

generally neglected branch in as attractive a light as possible, and has called to his aid the few original woodcuts in the first part of the work.

This brief outline of Pharmacy is in no way intended to replace that *practical* knowledge of the art which the writer believes is an essential accomplishment of every educated physician, and which he hopes to soon see rendered compulsory by examining bodies.

The condensation required in every page to keep the work in a small compass prevented that full recognition of the labours of many in the advancement of *Materia Medica*, which the writer would have desired.

He is grateful for the kind assistance of Mr. J. O'Neill, M.A., in the preparation of the Grammatical Aids to Prescription Writing.

BELFAST, *December, 1881.*

PREFACE TO THE THIRD EDITION.

THE rapid exhaustion (in a few months) of the second edition, and the delay caused by waiting for the new Pharmacopœia, have thrown this work out of print for some time.

It was found necessary to alter the order of arrangement of the different parts of the book, with a view of facilitating its rapid transit through the press. The section on Administration of Medicines and Prescribing, which formerly appeared near the end of the volume, is now placed before the Materia Medica section, and apparently with advantage. The plan of the work is not, however, interfered with, and, as stated in the preface to the second edition—

“The almost universally favourable way in which the work has been reviewed, and the many friendly criticisms received from practitioners and teachers, are helps for which the author is deeply grateful; and they have convinced him that the alphabetical and sectional arrangement of the book, which he adopted with diffidence and some amount of misgiving, should not in any way be altered or departed from in the present issue.”

BELFAST, *September, 1885.*

PREFACE TO THE FIFTH EDITION.

OWING to the rapid advances made in the treatment of diseases, and the ever-increasing number of New Remedies introduced within the last two years, the Author has re-written a considerable portion of the work. Nearly 100 pages of entirely new matter have been added; though, by a new arrangement of type and by a process of careful pruning, only a very slight increase in the bulk of the volume has taken place. The Section on Non-Official Remedies has been re-written, and, he hopes, has been brought up to the present date.

8, COLLEGE SQUARE N., BELFAST,
December, 1888.

PREFACE TO THE SIXTH EDITION.

THE present edition completes an issue of 15,000 copies since 1882.

The work has been carefully revised, and considerable portions have been entirely re-written, and, as the author hopes, brought up to present date.

By a different arrangement of type a large amount of entirely new matter has been added without increasing the size of the present volume.

The ever-flowing tide of New Remedies, which already seriously threatens to retard the proper study and true progress of therapeutics, necessitated the introduction of over 100 new drugs.

The recent "Additions" to the B.P. have been also incorporated.

The author is indebted to Mr. A. G. Caldwell for his valuable assistance in facilitating the progress of the work through the press.

8, COLLEGE SQUARE N., BELFAST,

October 1st, 1892.

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INTRODUCTION.

THE term MATERIA MEDICA implies a description of the agents used in the treatment of disease, their preparation, actions, and uses; but owing to the rapid advance made in our knowledge of remedies, special terms are now used to designate the different departments in this extensive subject; and we confine the words

Materia Medica to the description of remedies, their origin, source, distribution, chemical composition, and the methods by which they are obtained, &c.,

Pharmacy to the methods by which they are prepared for administration,

Pharmacology to the science of their action on a healthy organism, and

Therapeutics to their application in the treatment of disease.

The term *Materia Medica*, even so restricted in its application, embraces Botany, Zoology, and Chemistry, and, indeed, is built up of these sciences.

The term **Pharmacodynamics** is occasionally used, even by modern writers, when referring to Pharmacology; and the old term **Pharmacognosy** is sometimes retained in text-books as a synonym of *Materia Medica*. Both these terms can be advantageously dispensed with.

We may divide the science and art of Pharmacy into two distinct divisions:

Extemporaneous Pharmacy, and
Official Pharmacy.

The first head will include the various operations of compounding and dispensing remedies from the prescriptions of the physician, and under Official Pharmacy will be briefly defined the different processes mentioned in the British Pharmacopœia in the directions given for the preparation of its numerous drugs and formulæ.

Under the head of *Materia Medica*, in addition to the brief description of the physical characters, sources, chemical properties, doses, preparations, &c., of the various drugs in the *Pharmacopœia*, will be grouped together the Official Preparations themselves, mostly in tabular form, so that the student can have a bird's-eye view of their composition and doses.

The Pharmacology of each drug will be given under its name in the section of this work devoted to Therapeutics, where its *physiological* action will be briefly discussed in connection with its *therapeutic* indications and uses.

Under the head of Administration of Medicines will be treated the science of writing and reading prescriptions, and a short glossary of terms and abbreviations used by physicians in ordering remedies. Under this division of the subject the classification of remedial agents and the important questions of dosage or posology and of incompatibility will be dealt with.

The *materia medica*, pharmacy, pharmacology, and therapeutics of all the drugs not yet included in the British *Pharmacopœia* will be detailed in the section dealing with Non-Official Remedies near the end of the volume.

PART I.

PHARMACY.

CHAPTER I.

EXTEMPORANEOUS PHARMACY, OR THE COMPOUNDING AND DISPENSING OF PRESCRIPTIONS.

THE student is often confused by the frequent use of the words "compounding" and "dispensing." The former may be said to apply to the mixing, blending, or preparing of the drugs ordered in a prescription, while the latter refers to the way in which they are put up, labelled, and sent out to the patient: thus the incorporation of a mixture of several substances is spoken of as its *compounding*, after which it is to be *dispensed* in a flat, square, or round bottle; but if a prescription, for example, should contain an order for twelve five-grain Dover's powders, it would be simply a case of dispensing, since the medicine is always kept compounded by the dispenser.

It has been said that "no one should be allowed to *write* a prescription unless he is able to *compound* it," and if such were the rule of examining boards, doubtless more useful and more elegant prescriptions would be the fashion, and even if it were not so, the training requisite to make a good dispenser would be a great accomplishment to the practical physician, teaching him habits of neatness, readiness, and accuracy, and giving him a practical acquaintance with drugs obtainable in no other way.

The compounding of medicines can only be really learned at the dispensing counter; but a few general directions will be here given as a guide to the student. It is an essentially practical study; once the prescription is in the hand of the dispenser he

must give it his undivided and concentrated attention. Day-dreaming must be for the moment laid aside, and in proportion to the thoroughness with which he isolates himself from everything but the sheet of paper before him, so will his success be. The prescription should first be read carefully through, and any inconsistency of dose noticed. Difficulties in reading and deciphering will nearly always disappear on a careful comparison of the formation of the letters in the doubtful word with those in the unmistakable portions of the prescription. If an evidently poisonous, or even an unusually large dose is ordered, or if substances absolutely incompatible are prescribed, it will be well to consult the prescriber before proceeding further, but this will not be a likely or common occurrence. In compounding almost every prescription, there are several processes continually being employed which deserve a few passing remarks.

Weighing, the essential element of which is accuracy, is generally only required in dealing with small quantities, as rarely more than one ounce of any solid is ordered in a prescription; more commonly it is only with grains that the dispenser is directed to work, and in dealing with quantities from a few grains to as many drachms, the ordinary fixed upright beam and scales, which are found on every dispensing counter, answer all purposes. They are generally provided with one movable glass pan, which should be opposite the operator's right hand, and on to which the substance to be weighed is to be gradually placed, the weights having been previously put on the opposite scale. The pan, or scale, should invariably be wiped with a dry cloth each time after use. The omission of this is one of the minute points which stamps a slovenly compounder, and as a rule he who will not take the trouble to leave his scales and weights tidy after him will not take the trouble to weigh accurately the medicines prescribed.

For minute quantities of powerful drugs, like morphine, strychnine, and most active substances under two grains in weight, the scales that are being constantly used to weigh as much as two or three drachms should not be employed. For this purpose the small beam and scales figured should be used, and the substance gradually added, particle after particle, from a small spatula, till the scale comes to the level of the opposite, and remains there. In this manner the $\frac{1}{100}$ of a grain can be easily appreciated.

It is very often necessary to weigh small quantities of soft extracts for pills. This should only be done in this way:—Two little pieces of smooth writing paper should be made of the same size, which is accurately done by cutting a piece out of two leaves, one placed in contact with the other. When two

pieces of precisely the same size and weight are thus obtained, one should be placed on the left hand scale along with the weights; the other is to receive upon it the soft substance, and to be placed on the opposite scale, and when the requisite weight of material is added, it can easily be detached from the paper with a knife. The same plan should be used with corrosive substances, like iodine, if the scale-pan is not of glass.

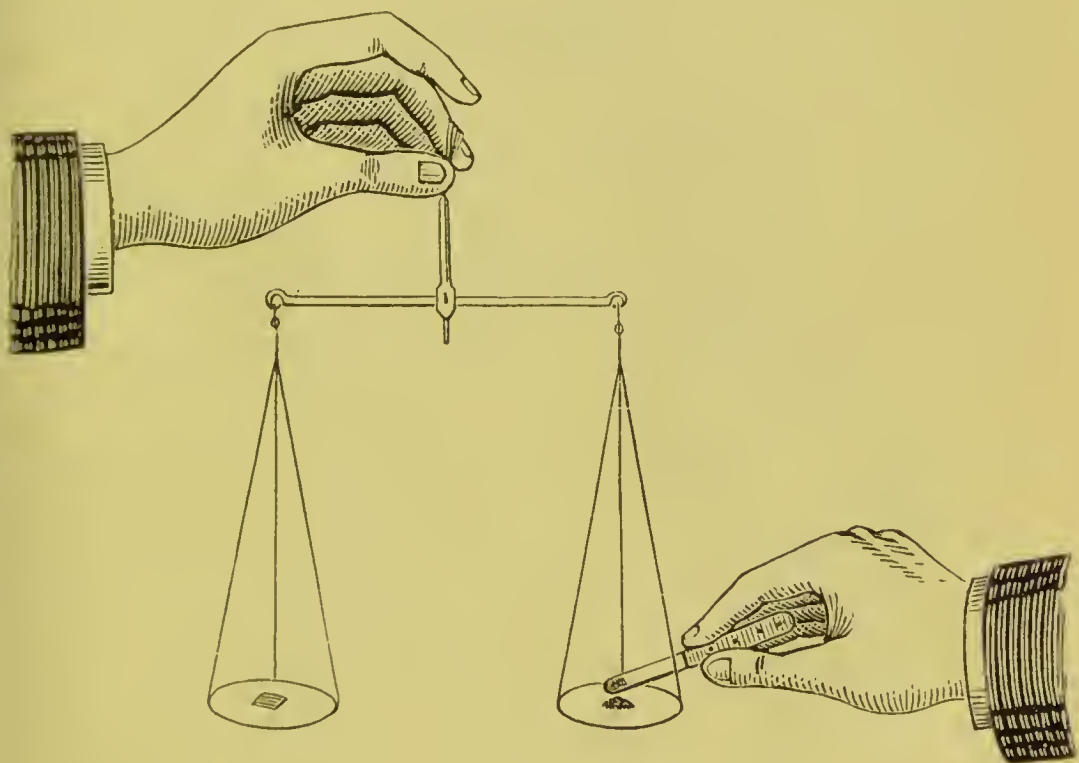


Fig. 1.

The Pharmacopœia recognises no weight between a grain and an ounce, the ounce being equal to $437\frac{1}{2}$ grains, and the pound being equal to 16 ounces, or 7,000 grains. These are the only weights that a student has to learn (unless that he is expected to have some idea of the metrical system).

It will be seen that in this weight, which is called the Imperial Standard or Avoirdupois weight, there is no drachm or scruple, but in the preface to the Pharmacopœia it is written that "it will be optional with the Physician *in prescribing* to use the symbols of the drachm (℥) and the scruple (℥), the former representing 60 and the latter 20 grains." However, it is now becoming the custom to order solids by grains or ounces, and confine the use of the drachm to the liquid measure of 60 minims, or the eighth part of a *fluid* ounce.

If, therefore, the dispenser meets with a drachm or a scruple of a solid substance in a prescription, he is to put in 60 or 20 grains

—though strictly $54\frac{1}{2}$ grs. and 18 grs. are respectively equivalent to the $\frac{1}{8}$ and $\frac{1}{24}$ th of an avoirdupois ounce.



Fig. 2.

The **Measuring** of liquids is a simple process, but, like many others, requires care and practice, and should be done always according to rule. Graduated glass measures are used of various shapes, which should have the lines marked both in front and at the back. The measure should be held between the thumb and next two fingers of the left hand (Fig. 2), and raised nearly to the level of the dispenser's eye. The bottle to be poured from is grasped firmly by the right hand, the stopper being previously withdrawn and held by the little finger of the opposite hand. The fluid is then poured out, the foot of the measure being held horizontally, the level of the liquid being tested by the lines on its front and back aspects. In looking through a quantity of liquid in a glass, two lines, or a double line, may be noticed, the upper one being caused by the concave surface of the liquid, produced by capillary attraction. The lower line, which is the true

level, is the one to be taken into account in measuring. *Never pour out with the label downwards*, otherwise the drop of moisture left on the lip will trickle down and injure it. The label should be *always* on the side of the bottle which is upwards, as in the Figure.

For measuring small quantities of medicine (and it is generally an active medicine which is ordered in small quantity), the measure which is used for ounces should not be employed, as it

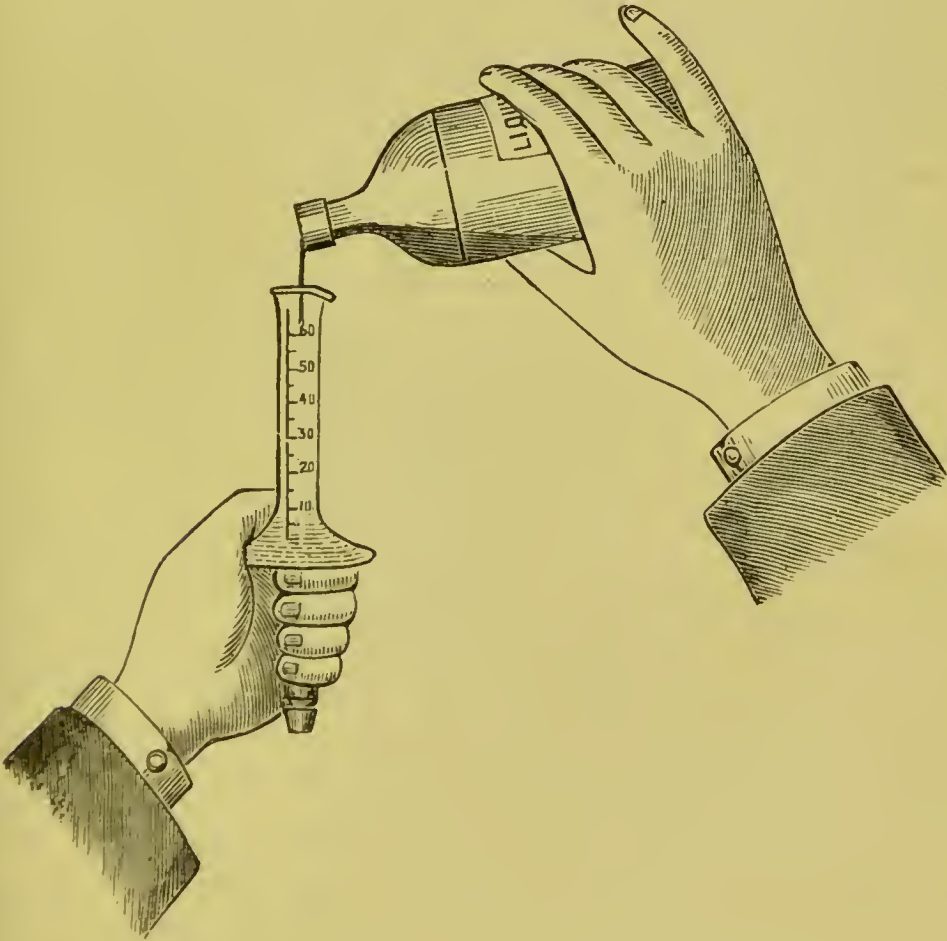


Fig. 3.

will be found impossible to be accurate in pouring a drachm into the bottom of a two-ounce glass. The measure which is figured should be then used ; it is known as a minim measure, and is of the capacity of either one or two drachms.

It may be held like the larger glass, but the careful and neat dispenser will hold it as in the Figure, which does not interfere with the light passing through even a minute quantity near the bottom. Some hold the larger measure in the same way. In measuring liquids in very narrow glasses like the one figured, the surface of the liquid will be found to be *deeply* concave,

owing to capillary attraction being stronger than in wide vessels, and it is sometimes puzzling to get the true level, which should be midway between the highest point close to the glass, and the lowest in the centre. It is not safe to count upon the lowest line as in working with the larger measures, because if we did the fluid which is attracted to the glass would not be included.

Substances like copaiba and castor oil should not be measured—not, however, because of the reason always assigned, that the measure is so difficult to clean, for accuracy should sacrifice every other consideration in compounding, but because of the fact that if one ounce of such a substance is carefully measured about seven-eighths of it only will be got out of the glass. Hence it is advisable either to weigh it, making allowance for its specific gravity, or else to pour it into the bottle in which it is to be dispensed, having previously marked with a strip of paper the extent occupied by an ounce of water in the same bottle. Before returning the stopper into a bottle out of which a liquid has been poured, the drop that hangs from the lip should be caught upon the bottom of the stopper by simply touching it—thus continual moisture is generally prevented from trickling down the side of the bottle; this little detail should be carefully attended to in the case of acids, corrosive liquids, and syrups.

Dropping.—The bottle should be lightly grasped in the right hand by all the fingers, except the index one, and held in a vertical position with the bottom downwards, till the stopper is lifted partially out by the fingers of the left hand, and held there by the right index finger, which presses it downward as the bottle is sloped to allow the liquid to drop out. Before permitting the drops to fall into any quantity of other medicine, a few should be allowed to drop on the floor till the dispenser is satisfied he has perfect control over the regularity with which the drops issue from the bottle in his hand, otherwise they might come out with a rush, rendering it impossible to count them, in which case the liquid or medicine into which they fall must necessarily be rejected. This may be avoided by the unpractised dispenser allowing the drops to fall into an empty measure, when, if too many flow out, he can reject them without risking the liquid into which they are to go; but if the drops be volatile, this should not be done. Liquids like chloroform, hydrocyanic acid, ether, nitrite of amyl, &c., should not be dropped, but always measured. A ten or twenty per cent. solution of such substances can be kept in stock, so that there may be no difficulty in accurately measuring the smallest quantities, as when two or three drops of dilute hydrocyanic acid are ordered in a draught.

It is a good rule to let each drop reach its destination before another flows out. If the drops hesitate to flow at the start,

the lip of the bottle should be wetted. When the dropping has concluded, the stopper is taken altogether out for an instant to allow the liquid accumulated about the neck to flow back again into the bottle before the stopper is thrust home ; various bottles, with patent stoppers, have been devised to facilitate dropping ; but, as a rule, every requirement is met by the

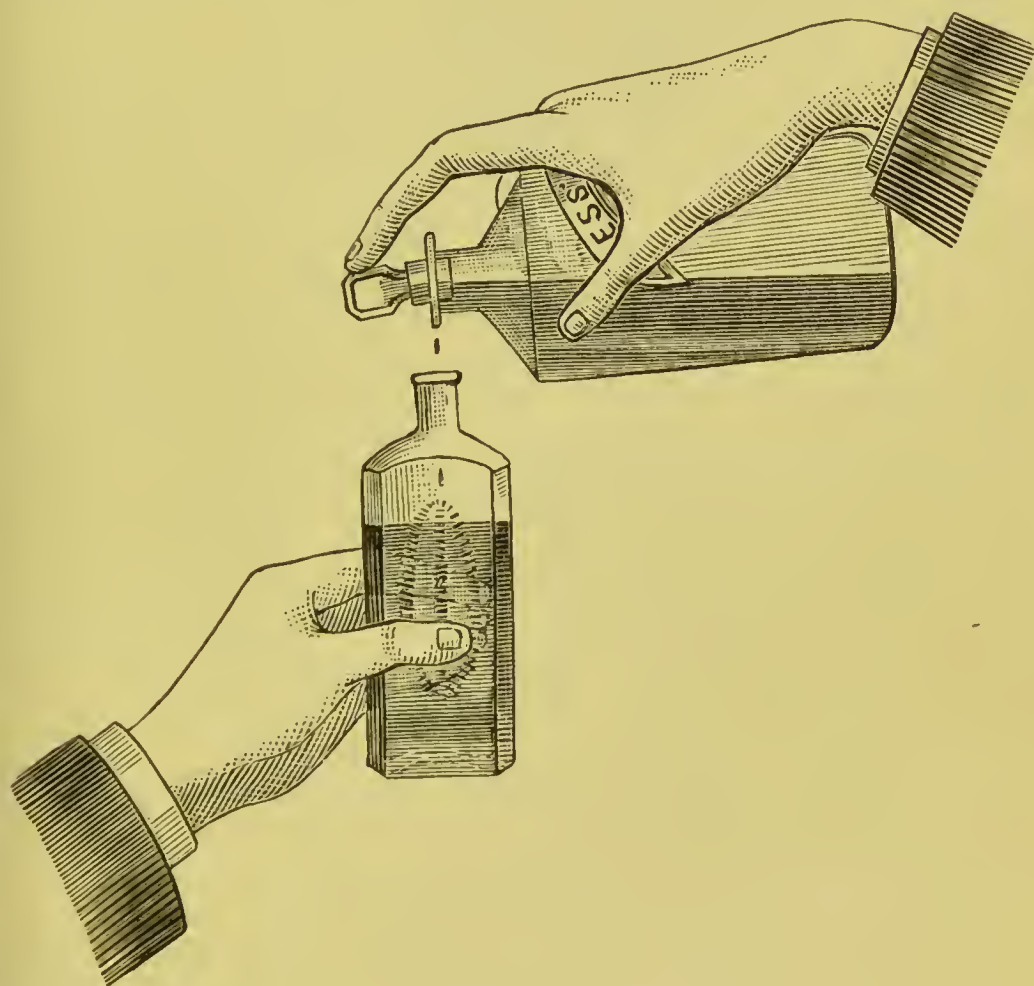


Fig. 4.

above plan. The student should remember that a drop is a vague and indefinite quantity, supposed to be identical with a minim, which it seldom is. Elaborate tables have been prepared, showing how many drops of certain liquid preparations are found to correspond with one drachm : thus it is generally stated that there are 120 drops of tincture of digitalis or laudanum in one fluid drachm, and 45 of Prussic acid in the same bulk. It is, however, well-known, that the number and size of the drops depend, not so much upon the nature of the liquid, as upon some accidental circumstances—as the shape and size of the stopper, or especially *the shape of the lip of the bottle*, and the degree of moisture about it, &c. The practice of

ordering drops should be entirely given up, and minims directed to be measured instead, unless, perhaps, when two or three drops of a flavouring essence are ordered in a mixture.

Hydrocyanic acid is best measured with a long graduated syringe, and many other liquids could be treated in a similar way with advantage.

CHAPTER II.

MIXING OR MIXTURE-MAKING.

UNDER the term "Mixture" in Pharmacy is included every extemporaneous fluid compound intended for internal use, except a few bearing distinctive names—as draughts or enemata. It would be difficult to give such general directions to the dispenser as would equally apply to the preparation of so many really different compounds—as solutions, emulsions, decoctions, &c. ; but a little practical experience will soon show him how he may apply the knowledge gained in making one class of preparations to aid him in compounding another.

Mixtures are ordered and dispensed in 2, 3, 4, 6, 8, 10, and 12 ounce bottles, and occasionally in 16 and 20 ounce ; and taking the simplest form of mixture, where two or more fluid medicines are ordered together, it will be seen that the compounding of this will only mean the measuring of the different ingredients in a glass and pouring them into a bottle ; still, this must be done methodically, and attention to the following is advisable :—Until the dispenser has had considerable experience he should, after reading over the prescription, carry the different medicine bottles required from their different places and set them down beside him before he begins to measure, otherwise he "may lose his head," or get confused in travelling from one part of the surgery to another. This practice, however, should be no excuse for bottles being left upon the dispensing counter ; after the mixture is made each should be carefully put back into its proper position ; and the same law applies to every operation in Pharmacy, for nothing should be left lying about out of its place : it is in this way mistakes are often made. It will be noticed that in carrying a stock bottle from its shelf, collecting it with others where the dispenser is to work, and putting it back after he has finished, its label will be certain to be examined at least *three* times. The skilful compounder will make up a mixture more expeditiously by taking the measure-glass in the left hand, as if about to use it as previously described, and the prescription between the middle two fingers of the same

hand, and, proceeding with his right hand entirely free, walking to and fro, he can compound his mixtures as quickly and accurately as if all were within reach of his hand—as they should be when possible. This is well shown in the Figure. Care is requisite to prevent the paper being soiled.

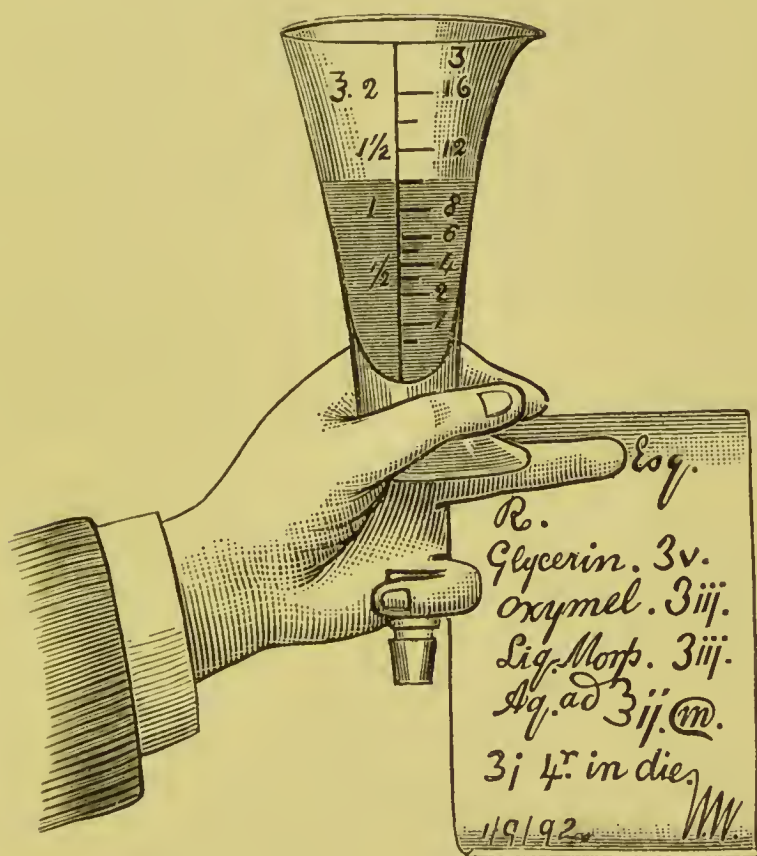


Fig. 5.

As regards the *order* in mixing liquids for a simple mixture, it is not of so much importance as in making emulsions, and often the ingredients can be mixed in the order in which they are written. It is a good plan to pour the tinctures or spirituous fluids (as they are measured) into the bottle in which the mixture is to be made, mix them, and then add the syrups or essences, and finally fill up with the water or infusion ordered; in this way a better mixture is often made than if the tinctures were each singly added to a large body of water, when their resinous principles would be sure to be precipitated. Suppose in a prescription of eight ounces of mixture, containing two ounces of tinctures, one ounce of mucilage, and five ounces of water, if the dispenser added the mucilage to the undiluted tinctures, an unsightly mess would be the result; the mucilage should either be added last, or, largely diluted with the water, before adding the tinctures; but the difficulty about the *order* of mixing ingredients

will be found to be more imaginary than real—a little common sense and experience will soon overcome it. There is, however, one rule which is almost universally neglected, and it is of importance:—If there be a very poisonous substance, like Prussic acid, strychnine, aconite, arsenic, corrosive sublimate, &c., ordered in a mixture, it should be put in the *last thing* before corking, unless there be some reason for the contrary. The force of this is obvious, for, if this be the dispenser's habit or rule, the possibility of his putting it in twice is out of the question; and often when the attention is unavoidably arrested, the ablest will forget what he has just accomplished. All mixtures should be briskly shaken before the label is put on, to ensure thorough incorporation.

Distilled water should be invariably used; no doubt, in many instances, it will be of little moment, but a mixture made at one time with distilled water and at another with fountain water, will taste differently; and, on the whole, it will be found advisable to use it to insure uniformity.

Should a mixture be filtered if not bright and clear? Unless specially ordered it should not, or unless some of the articles employed in its preparation were not as bright as they should be; it should always be strained through wetted wool or tow plugged lightly into a funnel, if any foreign particles are observed in it; this will almost always be necessary if the mixture has been made in a mortar; and most of the next class of mixtures get dirt incorporated with them, no matter how careful the dispenser is, and there are often foreign particles mixed up with the salt before solution which are not visible till water is added. It will be always necessary to run a little water through the strainer before pouring in the medicine. Suppose, now, the prescription contains a solid substance to be dissolved in the mixture, the dispenser, if the substance is very easily dissolved, may weigh it, drop it into the bottle by means of a little paper bent into a V-shape (off which most powders will pour like liquids), add the water or vehicle ordered, and shake briskly till the salt is dissolved; this often does away with the necessity of straining; but if the salt dissolve slowly, or if there be more of it ordered than the water will dissolve, then it must be rubbed up in a mortar with a pestle—to use which skilfully and neatly requires a good deal of practice and care.

Fig. 6 represents the mortar being used to triturate a hard substance. The pestle is firmly grasped by the right hand, and power is applied from the *shoulder and arm, the wrist being kept rigid*, and the elbow nearly stiff. By a series of rotatory movements, chiefly at the shoulder joint, the pestle is made to

travel slowly round the sides of the mortar—always being brought in the same direction, that is *towards* the operator's body, not from it—each rotation becoming shorter and quicker until the centre of the mortar is reached, when a few large sweeps bring it out to the sides again, and the same movements are repeated as before—the object being to crush each particle between the sides of the mortar and the pestle. The mortar should be steadied by the left hand, and as the material gathers



Fig. 6.

towards the handle of the pestle, it is to be scraped off with a spatula—which should occasionally be swept round the inside of the mortar. In this manner hard gritty substances are reduced to a fine powder.

If more of a salt is ordered than the water will dissolve, it should be in this way well rubbed up with successive portions of water, and dispensed as a fine powder lying at the bottom of the mixture, and not, as is often done, presented to the patient in large crystals which he doubts whether to swallow

or reject. Warm water would probably dissolve the salt and give a clear mixture, but on cooling, large crystals would form on the bottom and sides of the bottle.

Another class of mixtures is often ordered where a vegetable powder, as rhubarb or ginger, or a substance like precipitated sulphur or bismuth, is directed to be compounded with water generally thickened with a little syrup or mucilage, in which cases the most careless would hardly think of pouring the powder into the bottle and filling up with water, as it would thus reach the patient in little hard lumps or pellets. The powder should be weighed and put into a porcelain or wedgewood mortar, with as much water as will make a paste, and



Fig. 7.

after rubbing it smooth, more water is gradually added till a uniform mixture is obtained. The trituration here is of a different nature to that required in powdering substances or grinding them, as in the last Figure. In this instance the powder is already fine, and only its intimate admixture with water is required—hence the mortar is used in a different way, as Fig. 7 shows. A swift graceful movement is communicated to the pestle by the *wrist*, the handle being lightly grasped as a pen is held, and no motion should be allowed at the elbow or

shoulder; as in the last instance the pestle is made to sweep round the sides of the mortar always in the direction inwards or towards the dispenser, never "off" him. If syrup or mucilage is ordered to help the suspension of such powder in a mixture, it is advisable to rub the powder up with it first before adding water, and shaking all thoroughly before labelling.

When calcined magnesia is ordered in a mixture, an exception to the above rule of rubbing in a mortar may be made; thus, suppose an 8 oz. mixture, with two ounces of syrups or tinctures, two drachms of magnesia, and six ounces of water, be prescribed, here the dispenser may measure the water first in a large measure, weigh the magnesia and drop it on to the surface of the water, when it will gradually sink to the bottom as a perfectly smooth and uniform sediment. During its sinking he measures out the fluid ingredients, pours them into the bottle in which they are to be dispensed, by which time the magnesia and water are ready for pouring in on the top of them. This completes the mixture, which is whiter and more uniform than if rubbed up in a mortar, however clean.

Often a good deal of trouble is experienced with the froth that rises, especially upon vegetable solutions after agitation, preventing the bottle being filled or corked. A few drops of spirit cause this to rapidly disappear; and it is a good plan, if there be any spirituous liquid in the prescription, to keep a little of this to the last for this purpose. All mixtures with any deposit should have a label directing the bottle to be shaken before pouring out; and in all cases where the dispenser is in doubt about a mixture depositing a sediment, he should err on the safe side, and put on a "shake the bottle" label before sending it to the patient. It is a custom to direct all mixtures containing Prussic acid to be shaken before use. This has arisen from a mistaken notion that the acid floats upon the top when the mixture is allowed to rest. Such is not the case, but the very volatile ingredients in a half-filled bottle of mixture may rise in vapour and condense upon the inside of the empty part of the bottle, and on a dose being poured out it would contain a relatively larger proportion of the volatile substance, hence even in these cases a "shake the bottle" label should be put on, one thing being certain—that it can do no harm if unnecessary.

The next class of mixtures includes emulsions. They require more care and skill in their preparation and prescribing than most other extemporaneous compounds. An emulsion is a watery mixture resembling milk in appearance, containing an oil or resin in suspension, and not capable of easy or ready separation. The suspension of the oil or resin is effected through the agency of several substances, as gum, soap, alkali, or yolk of egg.

Several substances when rubbed up with water in a mortar make perfect emulsions; the gum-resins, ammoniacum, myrrh, and asafoetida behave in this way. The milky mixtures thus prepared are called *natural* emulsions, and the explanation of the phenomenon is simple—each substance contains, in addition to its resin, as much gum as will suspend it when water is added. If the pharmacist wishes, then, to make an emulsion with a resin, he imitates this natural preparation by adding gum acacia, or tragacanth, such is the official mixture of guaiacum, in which the resin is ordered to be triturated with a little sugar and gum, adding gradually the cinnamon water. The mucilage for emulsions should be always recently made, and not *acid*. The mucilage made from Pulv. Acaciæ is generally acid.

Oils are emulsified either by rubbing with gum or by adding an alkali (which makes a sort of soap with the oil), or by both gum and alkali, which is the most common method. Copaiba is made into an emulsion in a similar manner. Volatile oils require to be mixed with some fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

The powdered gum and water, or mucilage, should be measured into a mortar, and the oil gradually added, with continual *light* rubbing, the pestle being always moved in the same direction, more oil being put in only after the first added has been blended with the water. Generally speaking, there should be as much oil as watery fluid at this stage.

If the mixture gets too thick during the rubbing, a little water may be added from time to time to thin it; and when all the oil is thus incorporated, the mixture is poured into the bottle in which it is to be dispensed, and any other ingredients ordered, are to be very cautiously added, each freely diluted before being poured in, tinctures or spirituous liquors always being added *last*, in very small quantity at a time, and diluted; neutral or acid salts, if ordered, must be very cautiously added, as they run a fair chance of spoiling the union of the oil and water, but many alkaline salts strengthen it.

The object of the dispenser should be to cause minute division of the particles of the oil, and to get each minute particle covered over with a film of mucilage or albumen, which prevents its uniting again with neighbouring globules.

Some dispensers put the powdered gum or mucilage into the bottle with a little water, adding gradually the oil, with brisk shaking; such a plan is not to be recommended. Alkaline emulsions, may, however, be prepared in this way, and it is the way in which copaiba is generally treated; the alkali, commonly solution of potash, mixed with as much water as there is balsam or oil, is put into the bottle, the balsam added, and after brisk

agitation, complete incorporation will be effected, the bottle being gradually filled up, with continual shaking. The balsam or oil is often weighed into the dispensing bottle, and this is the most correct method; but it should be remembered, if a *perfect* emulsion is desired, this plan should not be followed, as the oil or balsam adheres so firmly to the sides that globules will always be floating to the surface after the dispenser thinks that all is safe. This may be obviated by pouring the emulsion into a new bottle, after all the ingredients have been added.

Tincture of senega in small quantity has the power of emulsifying fats and oils very efficiently. 5 minims will emulsify $\frac{1}{2}$ oz. of fixed oil.

Tinctura Quillayæ Saponariæ (4 oz. to 1 pint) possesses the same power, and is much used on the Continent for making emulsions.

The mixture having been compounded and put into the bottle in which it is to be dispensed, should be corked, and this must be done with care, as there are few things impress the patient so unfavourably as a cracked, dirty, or badly fitting cork; the dispenser should take the measure of the neck of the bottle with his eye before fitting the cork, and once it has been tried in the bottle it should not be put back amongst the others into the drawer, but regarded as a *soiled* cork. It is the custom to seal over the top of the cork with wax; coloured paper, leather, or tinfoil may be used; if leather is used in tying over a bottle it should be very thin, and put on quite wet, and without a single crease; it makes the most elegant finish, but is not commonly used. Labelling should be done with the most scrupulous neatness and distinctness, all flourishes being condemned. The margins of the label should be carefully trimmed, and a new label should never be put over an old one. A mixture should never reach a patient without being checked with care, when possible, by a second person.

CHAPTER III.

MIXTURES—*Continued.*

IT might not be out of place here to refer to a few of the difficulties in Mixture-making which the student may expect to meet with. The following may be taken as examples:—

Quinine in the form of a mixture is one of the most frequently prescribed drugs in the Pharmacopœia. Often it is ordered in combination with a little flavouring syrup and water, without any acid for its solution—and the officious dispenser occasionally falls into the error of adding sulphuric acid to effect its solution.

This is a mistake. The quinine should be rubbed up in a mortar with a little water, or added to the vehicle in its crystalline state, with directions that the bottle is to be well shaken before each dose is poured out.

When the acid is prescribed for its solution, the careless dispenser may drop the quinine into the concentrated acid previous to dilution with the vehicle or water, and an acid sulphate, which is only sparingly soluble, is the result. The acid should be freely diluted before the alkaloid is added.

Or quinine may be ordered with aromatic spirit of ammonia, tinctures, spirit of nitrous ether, or other spirituous liquids along with glycerine or syrup and water. In this case the alkaloid may be dissolved in the concentrated spirit, and the watery portions *gradually* added after the glycerine or syrup, so that if the mixture be not too dilute, a clear solution, instead of a muddy mess, may be presented to the patient.

Or quinine may be ordered with sulphuric acid and tannin, or some vegetable containing tannin, when a precipitate of tannate of quinine is the result. The dispenser should not fall into the error of filtering this latter out of the mixture.

Salicylate of Sodium or **Salicylic Acid** is occasionally ordered in a mixture with quinine, and the dispenser will find that a disgusting looking semi-solid mass forms in the bottle, and refuses to pour out. This latter case he should regard as one of absolute incompatibility, calling for a consultation with the prescriber. If this is impossible, matters may be partially remedied by adding mucilage to the quinine, and gradually mixing in the salicylate, dissolved in a large quantity of water, and shaking briskly.

Scale Preparations when ordered in a mixture should either be dissolved in a clean mortar, with warm water, or poured into the bottleful of the vehicle and agitated; if put into the dry bottle, and the water or vehicle added afterwards, a sticky mass cakes at the bottom.

Vegetable Extracts when prescribed in mixtures should be most carefully rubbed up in a *slightly* warmed mortar, with a little water, until a soft cream results, to which the vehicle is to be gradually added. If the extracts contain resinous matters, mucilage should be added by the prescriber.

Turpentine or **Terebene** will give the dispenser some trouble. If the emulsifying agent is left in his hands, he can make a good mixture with yolk of egg. It will require one egg at least for each ounce of turpentine. This applies to most ethereal or essential oils. Thick mucilage answers, but not so well. Turpentine has been successfully combined with a watery

vehicle by rubbing it up in a mortar, with about 2 per cent. of powdered Castile soap, adding the watery vehicle gradually, and shaking briskly.

Almond Oil emulsifies unsatisfactorily with mucilage or powdered gum. A small quantity of liquor potassæ or carbonate of potassium answers well, whilst a mixture of either of these with mucilage spoils an emulsion containing almond oil.

Spermaceti can be emulsified by rubbing it smooth in a mortar and adding a little spirit, just as in the powdering of camphor; after the evaporation of the spirit, yolk of egg, powdered gum, or thick mucilage—but preferably the former—will make a good mixture—especially if some syrup be present.

Cannabis Indica, Castor, Guaiacum, or other resinous tinctures, when ordered in the form of mixture, with directions for the use of an emulsifier according to the dispenser's fancy, will give some trouble. The best plan is to use a quantity of thick fresh mucilage, rather more than equal to the quantity of the tincture, which must be added only after dilution with water.

Borax, powdered and rubbed up with mucilage, forms a soft powder like moist sugar, which cannot be made liquid by the addition of any further quantity of mucilage, and acetate of lead, similarly treated, makes an opaque white jelly.

Spirit of Nitrous Ether will generally require to be neutralised with bicarbonate of potassium before being compounded with bromide or iodide of potassium, otherwise free Br. or I. will be liberated, and the mixture darkened.

Subnitrate of Bismuth is often ordered in a mixture with bicarbonate of sodium, and unless very great care is taken in compounding them, by permitting decomposition at a gentle heat, carbon dioxide will be produced, and the bottle will burst. This may be prevented by using an equivalent quantity of the carbonate of bismuth, with the prescriber's sanction.

Liquid Extract of Male Fern is generally ordered to be rubbed up with milk, fresh mucilage, or tragacanth, but egg will be found a better emulsifier.

Tincture of Tolu, Friar's Balsam, or Tincture of Myrrh, may be easily added to cough mixtures, when a small quantity of powdered tragacanth is ordered at the same time, and though the scrupulosity of the dispenser in closely following the letter of his prescription is to be admired, still if gum were added sometimes on his own responsibility, the unsightly messes which are presented to patients either through the oversight or

innocence of the physician would be greatly improved. Sometimes the relations which exist between the physician and the dispenser will quite justify the latter in making an alteration, but it is a dangerous ground, and he must always hesitate before interfering, unless where there appears a very evident necessity. Each case must be considered on its own merits, and no rule can possibly be laid down for the guidance of the young dispenser.

A Draught is a small mixture which is to be swallowed at one dose; it generally contains 1, 1½, or 2 ounces, and is compounded and dispensed in every way like a mixture.

Liniments, Injections, Lotions, Collyria, or Eye Washes, and Gargles, are compounded in the same way as mixtures, and the dispenser will have no difficulty with them. All poisonous external applications should be dispensed in differently shaped bottles from those used for mixtures; the blue glass hexagons with three fluted sides are by far the best for this purpose, and less likely to be mistaken for mixture bottles than any other. Strong liniments, in addition to bearing the words, "for external use only," should be marked "poison." Injections, mouth washes, or unusually strong gargles, should be marked "not to be taken."

A Linctus or Lincture or Loch literally means any medicine of such a consistence that it has to be licked or lapped off a spoon. They are not now often prescribed, and when the dispenser meets with them he mixes the ingredients together as for an ordinary cough syrup or confection, and dispenses them in a plain bottle, or if too viscid for flowing, he puts them into a wide-mouthed bottle or ointment pot.

Electuaries, Conserves, or Confections, are mixtures of a pasty consistence, generally containing powdered substances made into a soft mass with treacle, syrup, honey, &c. The substances prescribed in this form, if not already in fine powder, must be reduced to this condition and sifted; sulphur, rhubarb, jalap, ginger, and sulphate of magnesium are occasionally ordered in this form. The powders should be carefully triturated in a large mortar, and when thoroughly mixed the saccharine substance should be gradually added till a smooth, uniform, and impalpable paste is obtained. The powders should never be stirred into the treacle or honey, but the latter should be poured in upon the powder, and when compounded, the confection, if very soft, should be dispensed in a pot in which there is plenty of room for stirring up. If sulphate of magnesium is ordered, the dispenser may use the dried salt, allowing for its strength, as it is almost impossible to pulverise the ordinary drug.

CHAPTER IV.

THE COMPOUNDING AND DISPENSING OF POWDERS.

THOUGH nearly every vegetable substance in the Pharmacopœia may be prescribed in the form of a powder, still the most commonly ordered powders is not a very long one. The physician may order substances to be dispensed in this form which are not kept in powder, and the dispenser will consequently be obliged to pulverise them. This is done on the small scale by using a mortar like the one in Fig. 6; the pestle is grasped in the same manner, but wielded very differently; it is raised and lowered in a quick or jerky fashion for a few inches, and in a straight up and down motion from the elbow, each stroke being aimed at a particle, which is thus crushed between the end of the pestle and the bottom of the mortar. When the coarser pieces have disappeared, the pestle is to be used as in Fig. 7, and the powder ground between the sides of the mortar and the end of the pestle till the required fineness is obtained. The mortar for such an operation should be of wedgewood, and not too highly polished, as the roughness of the interior facilitates pulverisation.

If the substance to be powdered for a prescription happens to be a root, or leaf, or herb, which is rare (as such are almost always kept powdered in stock), then an iron mortar with a lid is to be used, for any considerable force should not be employed with a wedgewood or porcelain pestle. After the grinding has been performed till single particles are no longer visible to the naked eye, the powder should be passed through a fine sieve, and for very small quantities it is sufficient to extemporise a little sieve by stretching a piece of fine muslin over a large chip ointment box, out of which the bottom has been knocked, and securing it with a string or tight hoop like a drum head.

The bulk of a powder varies. Generally prescribers order less than twenty grains, often about five grains are prescribed. If only one powder is to be sent to the patient, it is simply weighed on the scale and placed upon a piece of paper, and, if containing more than one ingredient in a single powder, they should be carefully mixed on the paper with the point of a knife, for though the patient is to swallow the entire powder without division, and its mixture is practically of no importance, it looks careless, and does not impress him favourably on being able to distinguish different shades of colour in what he is about to take. Powder papers should be glazed, and

the folding is completed except the turning back of the ends. The dotted lines show the space originally covered by the paper. In this method the powder is technically said to be folded "to" the dispenser. Most commonly, however, it is folded "off" him, and this is the proper way, only it is more difficult to accomplish it for the first time. It is done in the same way

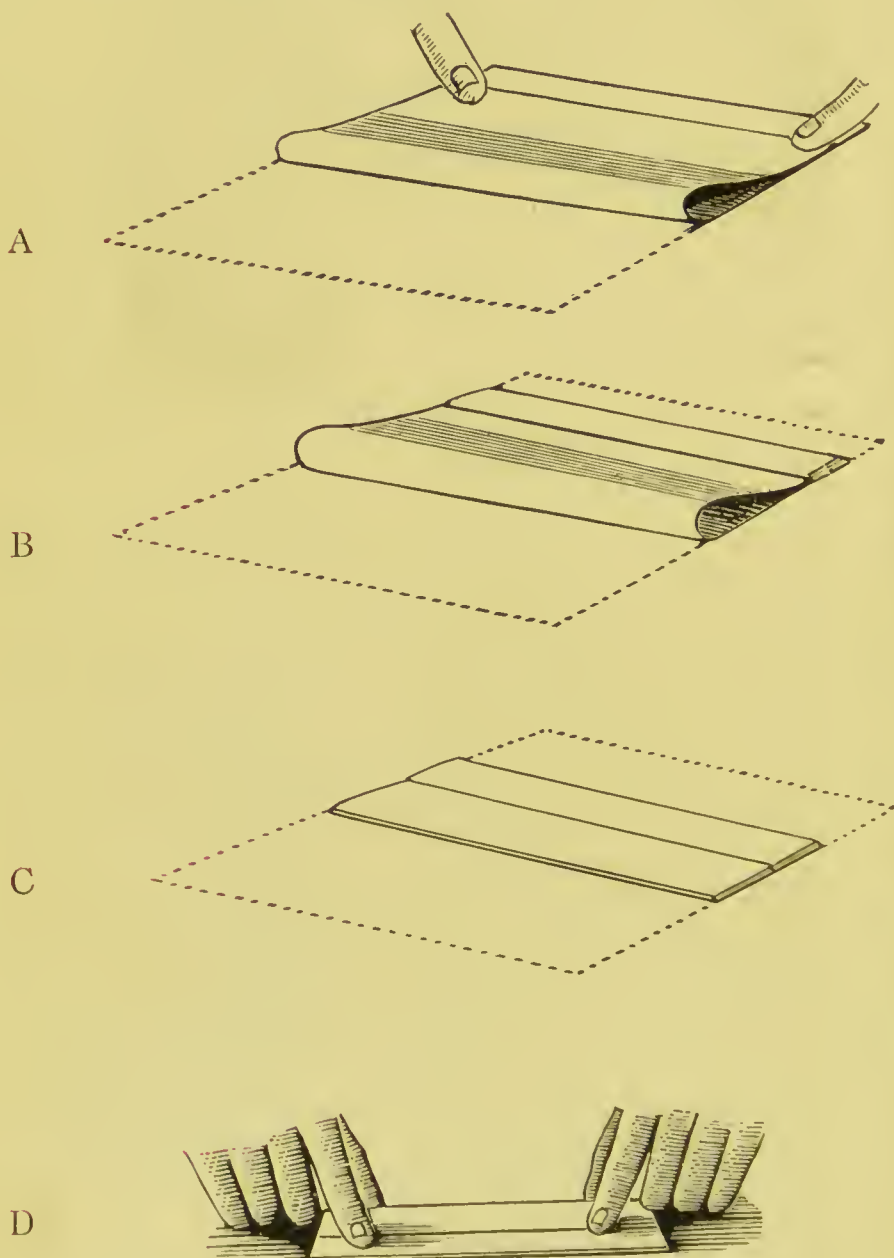


Fig. 10.

precisely, except that the near edge of the paper is brought to within half an inch of the farthest edge, which is turned over on it, and again both are turned over as before.

The following still simpler method of folding a powder may be easily mastered by the student :—He places the paper before him with the powder in its centre, and turning back into a flap about half an inch of the margin next him, he smooths it down flat upon itself. Into the crease of this flap he inserts the edge of the paper farthest from him, and bends both over exactly as in the two previous instances, and finishes the ends as before.

The first method is the most difficult to accomplish, but it is the best, as by it the dispenser folds large bulky powders, like magnesia, Gregory's powder, &c., which cannot be properly folded otherwise. Suppose 1 oz. of the sulphate of magnesium is to be dispensed in a paper, the dispenser weighs it out on a paper, and proceeds exactly as in the first instance of folding a small powder, as in Fig. 8. He does not, however, fold back the ends over a folder, but gathering in loosely the left end, he closes it so that the packet can stand upon it, like an upright cylinder open at the opposite end. Into this end he inserts his right index finger, and folding the paper round it he withdraws it, causing the end to retain the creases into which it falls. He then bends down the folded-in flap, and undoes the end upon which the packet was standing, which now goes through the same process as the right end, after shaking down the contents and making the surface even. Practice only will enable the dispenser to fold a packet in this way, as it is impossible to clearly describe it in a book. The little time lost will be amply repaid by the education which the fingers receive.

If more than one powder be ordered, the dispenser proceeds in a different way. Suppose, for example, twelve five-grain Dover's powders are to be dispensed, two ways are open to proceed. First, spread twelve papers out on the dispensing counter in four rows of three each. Weigh 5 grains, and place them on each paper till the dozen powders are weighed out. Then begin to fold one after another till all are finished. This is a tedious plan, for which the expert and experienced dispenser sometimes substitutes the following :—Weigh 60 grains, place it on the centre paper, and divide the heap with a knife into twelve portions, now adding a little to one and taking some from another, till the *eye* is satisfied that all are about equal ; or, till a little practice is obtained in this method, weigh out 30 grains and divide into six papers. It is surprising how the eye so soon becomes educated to discriminate small differences in the size of the powders. This method, however, is not applicable to large powders, and should only be practised after very considerable

experience of weighing; the writer cannot recommend it, especially to the student, and it is condemned by high pharmaceutical authority.

Ordinarily, in prescribing powders, the medical man writes the form as if for one powder, and then directs, say, twelve such to be sent; hence twelve times the quantity of each substance is weighed and put into the mortar, generally in the order in which it is prescribed, for as a rule it matters little in what order the ingredients are mixed, provided they have been previously in a state of fine powder. But if a very small quantity of an active ingredient be ordered, it should first be put into the mortar with about twice its bulk of some of the more inert ingredients; and after careful trituration, using the pestle as shown in Fig. 7, the remaining substances are gradually added. The mass of the powder should not be divided until the most thorough mixture has been accomplished.

Sometimes the physician orders a certain weight of the different ingredients to be mixed and *divided* into a number of powders. Here the dispenser might make a terrible mistake if he multiplied the quantity by the number of powders instead of dividing, and he should be always on his guard against such an accident. Substances which are perishable, as ergot, are sometimes ordered to be dispensed in this form; or substances which are volatile, as camphor; or deliquescent, as carbonate of potassium; or liable to chemical decomposition, as sulphide of calcium, or the valerianates; in which case they should be folded up in the ordinary paper first, or, preferably, in waxed paper, and then each one covered with tinfoil, and sent out in packets of 4 or 6, which are again covered with an extra piece of the foil, and if to be kept for any time they should be enclosed in a wide-mouthed bottle.

^{or in a} Sometimes a powder like Gregory's, ginger, soda, rhubarb, &c., is prescribed in quantity, with directions for a teaspoonful or other dose; or powdered borax is prescribed for injecting. In such cases the dispenser should send it to the patient in a wide-mouthed bottle, well corked, or even in some instances in a bottle with a glass stopper.

When as many as six or eight small powders are ordered they should always be folded exactly of the same length on a folder, and sent in a cardboard box. Numbers under this are generally dispensed in small oblong envelopes, made for the purpose, and on which the directions can be written like the address on any ordinary letter. If sent in a box or bottle, a small label is gummed on the outside.

CHAPTER V.

COMPOUNDING AND DISPENSING OF PILLS.

THIS is perhaps the most difficult work of the dispenser, from the complexity of the process through which the mass has to pass before the finished pills are in a proper condition to be presented to the patient, and partly also because he is often left completely to his own resources to unite in a pilular form ingredients unsuitable and without any cohesive property. Pills should be perfectly spherical, and should not be larger than can be readily swallowed without chewing; each should not exceed 5 grains in weight, unless the ingredients are exceptionally heavy—as calomel, bismuth, reduced iron, blue mass, &c.—when 8, 9, or even 12 grains may be with skill compounded in a fair-sized pill. On



Fig. II.

the other hand, as many as 5 grains of a light vegetable powder will be sure to make too bulky a pill, as the weight of the excipient or material added to give body must be taken into account. The choice of the excipient is often left to the

dispenser, and some experience is necessary to guide him in his selection. The most common are: gum or mucilage, soap, syrup, spirit, or some soft extract, as gentian, inert in very small doses.

Mucilage, the most commonly used excipient, is well adapted to make vegetable powders into pills, but, as a rule, its use should be restricted to pills that are soon to be consumed—otherwise they will get very hard and insoluble. For mineral powders it is not so suitable, as the pills made in this way are apt to flatten, or “go down.”

Tragacanth is a very good excipient; in the form of the compound powder it is especially so when added to masses which are already too soft, as it gives body and elasticity; but if used too freely, the pills retain the cylindrical form, and after a short time may lose all traces of rotundity. Tragacanth and water give good consistence to substances like nitrate of bismuth.

Honey and Treacle are used in preference to mucilage, as they make nearly as good a body, but with less risk of becoming hard.

Tincture of Gentian and Treacle, equal parts, make an excellent excipient, giving firmness and toughness, and ensuring solubility. It is particularly suitable for quinine.

Syrup is used for the same purpose when very little room is left for the excipient, but it makes crumbly masses with metallic salts.

Soap makes an excellent pill when added to resinous substances; it does not get hard, and is not apt to crumble, unless a substance like sulphate of iron be added.

Sawdust finely sifted has been highly recommended by Mr. Proctor, as an excipient to give toughness to soft masses; it imparts great retentiveness of shape, with little increase in size.

Glucose has been recommended by Mr. Lascheid.

Spirit is used in working up resinous substances; it is, however, very difficult to work with, as there is great danger of adding too much, which causes the mass to “drop,” and if too little be added no effect is produced at all.

Decoction of Aloes.—A very few drops of this liquid make a workable mass with aloes and gum resins.

Kaolin is of great use in making a mass with substances which ordinary excipients decompose, as Pot. Permang., Argent. Nit., &c.

Liquorice and **Marshmallow** in powder give elasticity to soft masses.

Glycerine in very minute quantity occasionally assists dry crumbly masses ; it is treacherously hygroscopic.

Wax melted or in shavings makes a beautiful mass with creasote, camphor, carbolic acid, and most essential oils ; it, however, makes an indigestible pill, and is not to be recommended.

Water is a dangerous excipient to use except in cases where powdered gum is present, as it forms a brittle mass liable to flatten.

Bread-crumbs for croton oil and carbolic acid, **Basilicon Ointment** for the scale preparations, **Confection of Roses** for vegetable powders, are deservedly little used now.

Calcium Phosphate is recommended in small quantities to give pilular consistence to greasy substances.

The dispenser will see that he has a long list of excipients, but a little experience will soon teach him that when he gets to *know* an excipient he can do almost anything with it ; and most pill-makers have their favourite.

Proctor's Paste.—The writer, in recommending an excipient for *general purposes*, believes that none can be found equal to a paste made of—Powdered tragacanth, 1 dr. ; glycerine, $3\frac{1}{2}$ drs. ; water, 1 dr.

It improves by keeping. The inexperienced dispenser will be amazed how little of this substance will be sufficient to give consistency, toughness, and retentiveness to the most unpromising mass. The B.P. glycerine of tragacanth may be used instead.

The dispenser having read over the prescription, and thought of the excipient which he will use, if such is not already directed by the physician, proceeds now to weigh the different ingredients, taking the substances that require pulverisation first ; when all the dry ones are thoroughly mixed, the soft extracts are added, and the mass worked up in a mortar.

The proper mortar is figured at the beginning of this chapter. It is very shallow, there being one mortar or shallow depression generally in each end of it ; it should be of unpolished wedgewood ware, and very thick, with a small pestle—which is to be worked in a totally different way from any yet mentioned—the pestle being used as a lever, with the edge of the mortar next the operator as a fulcrum ; and great force is necessarily applied, in order to squeeze the substance between the end of the pestle and the side of the mortar at each stroke, the mortar being firmly grasped by the left hand and turned round occasionally, so that all parts of the pill mass are exposed to the action of the pestle. It will thus be seen that the process is one of squeezing or kneading rather than pounding.

The student will do well to review at this place the different methods of using the mortar and pestle, as required for different results, and a little reflection will teach him more than a year's blind practice, for unless he has some idea of the scientific action of the machine, he can scarcely chance to wield the pestle efficiently or gracefully. It is used in at least four different ways:—1.—(As shown in Fig. 6.)—The pestle is grasped firmly, the wrist and elbow joints kept almost rigid, while the pestle is made to traverse the sides and bottom of the mortar, all the motion being at the *shoulder* joint (circumduction). 2.—The pestle is grasped in the same way, the wrist and shoulder joints are fixed, while the fore arm is raised and lowered alternately—as a gold-beater uses his mallet—all the motion being confined to the *elbow* joint (Fig. 6). 3.—The pestle is grasped like a pen, and with a light, quick, easy motion at the *wrist* it sweeps round the inside of the mortar (Fig. 7). 4.—The pestle is grasped by the fingers, the expanded end of the handle being firmly planted against the centre of the palm, its middle resting against the inside edge of the mortar, when the three previous movements are executed, and the pestle is driven slowly and forcibly against the opposite side of the mortar—the pill mass being between—here *shoulder*, *elbow*, and *wrist* are vigorously in motion (Fig. 11).

The ingredients being worked into a uniform stiff mass in the mortar, are to be scraped out with a small spatula, and it is a good plan to work the mass for a few minutes between the fingers, in order to soften and toughen it. It is next rolled into a ball or cylinder with the finger and thumb, and transferred to the marble slab of the pill machine, on which is dusted a little finely-powdered chalk, starch, or lycopodium; the back

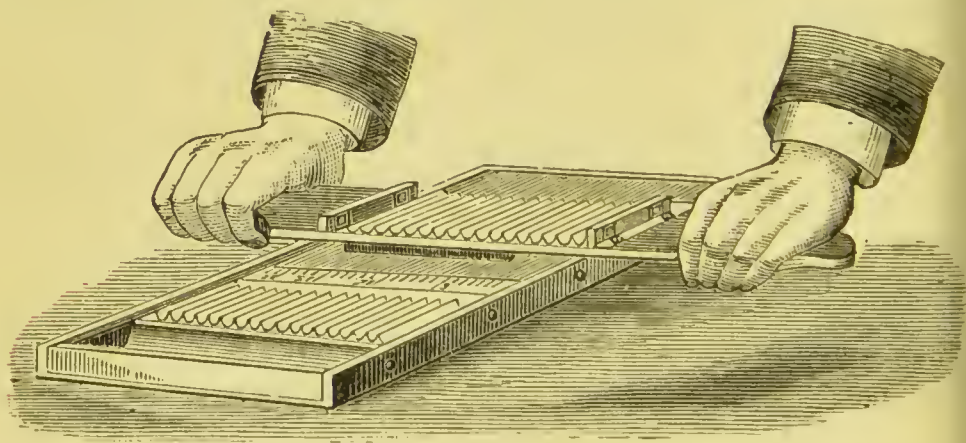


Fig. 12.

of the handle of the machine is used to roll it into a long cylindrical form, great care being required to prevent the

cylinder tapering out thin at either end; a very light and quick motion backwards and forwards will prevent this—the handle being held perfectly horizontal, as shown in the sketch (Fig. 12), and each hand bearing an equal weight on the mass as it is rolled backwards and forwards over the slab. It is brought from time to time alongside the scale, and when the number of pills into which it is to be divided corresponds with the number marked there, it is gently lifted or rolled with the fingers on to the grooved part of the machine; the handle, with its grooved surface downwards, is laid on it, and by a series of rapid and short movements, with both hands, abruptly brought to a close by pushing the handle from the dispenser, at the same time

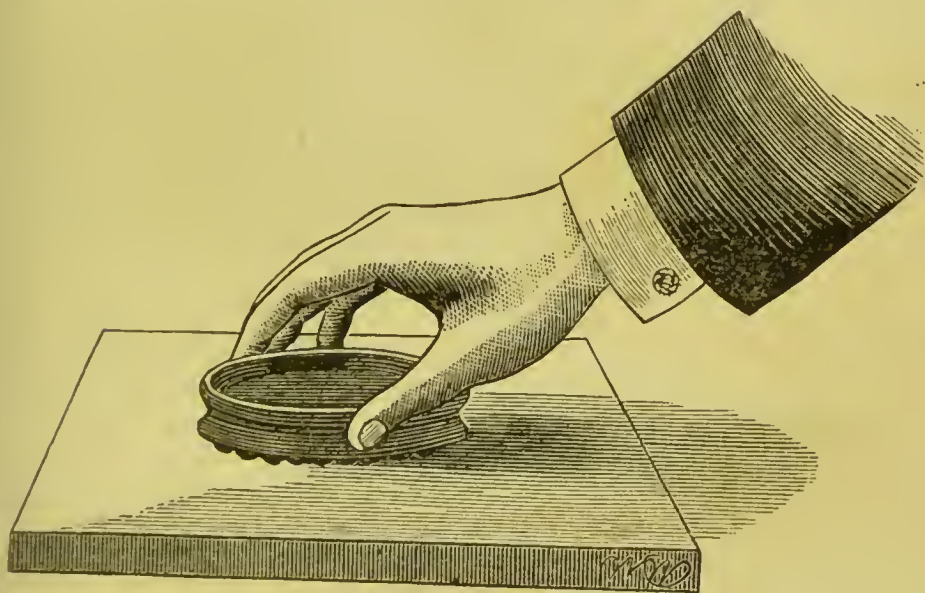


Fig. 13.

turning it on its own axis in his hands, the cylinder is cut and rounded into globular pills, which, with the last motion, are pushed into the box or tray at the end of the machine. If the operation is successful, and the mass of good consistence, no further handling will be necessary; but generally the track of the machine will be visible on each pill, and another process is required before the smooth globular form is perfect. The pills are again placed on the dusted slab, and covered with a pill-finisher—which is only a circular shallow boxwood tray, not so deep as the pills—and by a series of rapid rotatory movements the traces of the machine are dispelled, and a more spherical and polished appearance is given. (Fig. 13.)

If the pills are very soft this cannot be successfully done, but they must be rounded separately between the finger and thumb.

There is another and more convenient method of making pills in small quantities ; it is by means of the graduated tile and a spatula. The ingredients are weighed and placed on the tile—which is of porcelain or wedgewood ware, with very little glaze on its surface.

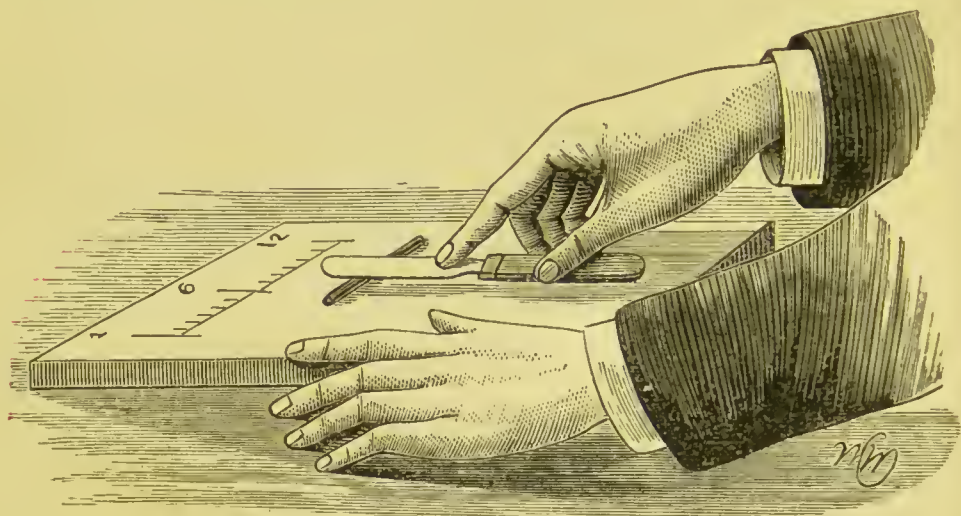


Fig. 14.

With the square end of a stout spatula, technically called a spud, the mass is worked into a uniform consistence, and, after a little kneading with the fingers, it is rolled out between the blade of the knife and the dusted slab, brought to the scale and cut into pieces, which are rounded into pills between the thumb and next two fingers of each hand. Figure 14 shows the rolling out process. Or the mass may be made in the pill-mortar, and transferred to the tile, where it can be rolled out and cut.

By submitting the tile to a uniform heat—viz., by immersing in hot or boiling water and rapidly drying, hard masses which could not be otherwise brought into the pilular form, can be easily softened by kneading between the end of the spatula and the heated slab. In this way also small quantities of soft extracts can be dried or hardened by being spread out in a thin film on the *warm* slab, but great care is required lest the active principle of the extract be injured by the heat and exposure. Some pharmacists prefer a tile made of metal.

Machines are now made on the cylindrical roller principle, by which as many pills can be prepared in an hour as the old-fashioned machine could turn out in a day, but they are only useful where very large quantities are to be rolled out at once.

The pills having been prepared as described, should be left out to dry (unless urgently required), either on the slab of the pill machine, or in some dry and warm place, whilst the label

is being written and the box prepared in which they are to be dispensed. The box should be large enough to hold them in a single layer, otherwise they will be liable to stick or become flattened. Pills containing volatile ingredients should be always dispensed in a bottle, of which there are many kinds manufactured for the purpose with wide mouths. Some powder must be put into the box or bottle to prevent them adhering to each other or to the vessel, and different dispensers are in the habit of using different powders for the purpose. Chalk, lycopodium, flour, liquorice, &c., are used; powdered French chalk will probably be found to be the most elegant and efficient.

CHAPTER VI.

PILL MAKING.—*Continued.*

THE coating of pills has seen many changes of fashion, and doubtless will, but it is questionable if ever a more satisfactory method will be introduced than the old-fashioned plan of covering the pill with a thin layer of silver leaf. To do this properly requires some neatness and care. The following directions, if followed, will give a successful result:—There should be no trace of powder about pills intended to be silvered. The silver leaf as it lies flat in the book in which it is originally supplied by the manufacturer, is exposed, and each pill is rolled between the thumb and the next two fingers, which have been previously rubbed against a little mucilage dropped on the slab of the pill machine, and when a sticky layer is felt to be imparted to the pill, without being so abundant as to drop off or run, it is allowed to fall on the silver leaf, and another treated in the same way, until twelve or fifteen pills are dropped at equal distances apart on a single leaf.

The silver leaf with the pills on it is allowed to quickly slide off the book into a spherical, or egg-shaped, boxwood vessel, which is to be shaken cautiously, the hand containing the box being turned round, making a circle in the air, for about one minute, so as to cause the pills to run round its inside, when an even and lustrous coating of metallic silver will be seen adhering to and completely covering each pill. Any loose fragments of leaf can be blown away, and after a short exposure to the air on the slab, the pills may be enclosed in the bottle or box in which they are to reach the patient. Gold may be applied in the same way. Pills containing blue mass in any considerable proportion should not be silvered, the mercury making an unsightly amalgam

with the silver leaf. Asafoetida, when coated, turns the silver black, and consequently gold should be used.

Sugar will give a pleasing coating; its success, however, requires much practice. If the pills be covered with a film of mucilage, syrup, or gelatine, and turned into a circular box containing finely powdered sugar and starch in equal quantities, brisk circular movement for a few minutes is all that is necessary; the addition of a little finely powdered tragacanth to the starch and sugar gives a more elegant finish.

Pills are sometimes coated with gelatine, which makes a coating that is both soluble and looks well. A strong solution is made by heating one part of gelatine with two of water, and each pill, stuck upon the end of a fine needle, is dipped into the solution, the other end of the needle being thrust into moist sand till the gelatine sets, when the needle is withdrawn, and its mark closed with a little fresh gelatine.

Pearl Coating.—A new process is rapidly coming into favour of coating pills with albumen. It can only be satisfactorily carried out when the pills are very hard and firm. Each pill is rolled between the finger and thumb with a little egg albumen, and afterwards rotated till dry in a warm pill-tray or cup; or after receiving the coating of albumen they may be thrown into a tray with powdered French chalk or sugar, or a mixture of both these substances, and rapidly rotated till a perfectly smooth and glistening surface is obtained. The superfluous powder should be removed, and the rotation continued till a high polish results.

Collodion, sandarach and mastich varnish made with ether, are sometimes used to give a smooth surface to well finished pills by dipping each pill, fastened upon the point of a fine needle, into either of these liquids. The pills must be very dry before immersion. They are liable, however, to prove insoluble, and the writer has seen varnished pills passed unaltered through the bowels.

Keratine Coating.—This process is used where we wish to so coat a pill that it will be unacted upon by the acid gastric juice, but will still retain its solubility when brought into contact with the alkaline secretions of the intestines. A thick solution obtained from the shavings of horns by treating them with pepsin, acid, and ammonia, is applied for two or three times to the surface of each pill.

A **Bolus** is sometimes ordered in a prescription, as 10 grs. of quinine may be prescribed by the physician, with directions for the dispenser to make it into a "bolus," with honey, treacle, syrup, or any thick fluid. In England such a dose is sent out to the patient in one large, firm pill; but often in Ireland, and

elsewhere, the pharmacist adds a sufficient quantity of the liquid substance to make a soft paste, like a confection or linctus, which he encloses in a piece of waxed or oiled paper, folded like a powder, with directions that it is to be scraped off with a spoon, and bolted or swallowed like jam. It is at the best an inelegant and often disgusting form of administering medicine. The ordinary wafer papers, sold in circular boxes, afford an easy, elegant, and inviting method to the patient, whereby he can swallow the most nauseous powders, pills, or boluses, without tasting them. The wafers are composed of flour and water, which become limp when wetted, and they can be readily wrapped around the nauseous morsel and swallowed as easily as a spoonful of pudding.

The student will often be puzzled in compounding pills, especially as no rules can be laid down for his guidance in selecting an excipient for every case. The following are a few of the difficulties, and their solutions, which he may often meet:—

Strychnine or other powerful alkaloid is ordered in minute quantity, say $\frac{1}{32}$ grain. It should be rubbed up with a little sugar of milk crystals to fine powder, and after the addition of about $\frac{1}{4}$ gr. of liquorice powder, Proctor's paste, extract of gentian or mucilage, will make a mass. The dispenser should have a rule of *making the weight of such pills up to one grain each*.

Aloes in any quantity in a mass is best made up on a heated slab with proof spirit or decoction of aloes in *minute* quantity.

Butyl Chloral Hydrate should not be treated with the tragacanth paste, which dissolves it and causes the pills to flatten. It is best worked up with a little confection of hips and thick mucilage.

Croton Oil makes a good mass with powdered liquorice and mucilage or with bread crumb.

Extracts, when ordered without any powdered or dry substances, can be made into pills with gentian or liquorice powder.

Gallic Acid 5 grs. (in fine powder) and glycerine $\frac{1}{2}$ drop make a good pill.

Iodide of Potassium should be rubbed up with a few drops of water into a smooth paste, and made into a mass with a little liquorice powder; 6 grs. may thus be got into a fair-sized pill. The proportions of liquorice and water will depend upon the sample of iodide, as this salt varies much in its suitability for making pill masses.

Phosphorus should be dissolved in bisulphide of carbon, and whilst solution is being effected two or three drops of chloroform may be added, which produce a heavy vapour around the solution and prevent oxidation of the phosphorus by the

atmospheric oxygen. A little liquorice powder is now added, and the mass quickly made into a workable form with Proctor's paste, divided into pills and varnished. Phosphorus is made into a pill by some pharmacists by melting it in cacao butter or mutton suet, and, when cold, beating it into a plastic mass, to which a little powdered liquorice may be added.

Quinine 8 parts, tartaric acid 1 part, with q.s. of Proctor's paste, make a mass much less liable to crumble and of less bulk than if the acid be omitted. They soon become insoluble.

Camphor must be powdered with a few drops of spirit, and Proctor's paste added *after the spirit evaporates*.

Carbolic Acid may be easily made into a mass with $1\frac{1}{2}$ grs. wheaten flour to 2 grs. of the crystallised acid, or with bread crumb, or with powdered marshmallow or elm bark, to which a trace of Proctor's paste is added.

Creasote is made into a mass by Martindale by adding animal soap, and heating on a water bath. Powdered liquorice, to which a few atoms of bees' wax are added, affords a plastic workable mass. If ordered in a pill with oxide of silver, creasote will explode unless the oxide be first diluted by trituration with some inert powder like liquorice or gentian.

Copaiba can be made into firm pills with a little carbonate of magnesium. They soon become insoluble.

Citrate of Iron and Quinine can be best quickly worked up with the smallest possible quantity of spirit and water, mixed in equal proportions.

Calcium Sulphide should be mixed with an equal quantity of sugar of milk, and, after careful trituration, as much powdered decorticated liquorice root added as will make the weight up to, say, a grain. The mass can now be worked easily with a little tragacanth paste. Sugar of milk makes the best powder to aid the sub-division of an active substance, and the powdered decorticated root of liquorice is the best inert powder for making up pill masses, as it is so fine that it does not make a crumbly pill.

Rhubarb Powder makes an elegant mass with $\frac{1}{5}$ th its weight of glycerine.

Tannic Acid can be manipulated with $\frac{1}{5}$ th its weight of glycerine and about $\frac{1}{10}$ th part of mucilage.

Permanganate of Potassium, in a pill, requires much care at the hands of the dispenser, as it yields oxygen in contact with organic matter; it may be finely powdered and made into a mass with cacao butter and a little soft paraffin. Resin ointment makes also a good mass. Martindale advocates an excipient of

soft paraffin, hard paraffin, and kaolin, whilst Proctor only uses kaolin and a little water.

Where the dispenser has the choice of an excipient in pills which are not to receive a coating of any kind, he should select an excipient which will not alter materially the colour of the mass; thus, quinine, bismuth, camphor, and all white substances should be made into a white mass when practicable.

CHAPTER VII.

THE COMPOUNDING AND DISPENSING OF OINTMENTS.

THE making of an ointment is generally a very simple matter, only requiring perseverance and painstaking, which always repay the dispenser. It is often a matter of simple trituration; and a pestle and mortar, with a spatula, are all the implements required. Rarely, if ever, will the extemporaneous ointments ordered by the physician require any melting.

If two ointments, or an ointment and a liquid or oil, are ordered to be mixed, the simplest method of procedure is to weigh and measure the ingredients out on a porcelain slab, and thoroughly blend them with a long spatula. This will answer in many instances, but the dispenser is cautioned against making extracts, powders, or gritty substances into an ointment in this way.

In such cases the substance to be incorporated with the fatty or oily basis is put into a mortar and ground with some minute quantity of excipient to the finest conceivable state of subdivision, and by far the best excipient ever devised is a little of the old-fashioned "elbow-grease." The pestle should be worked as shown in Fig. 6, and the mortar should be capable of holding very many times more of the ointment than is about to be made. When the powder, or extract, or crystal is put into it, it is subjected to firm powdering or rubbing. A very little of the fatty basis is added, and trituration continued till a smooth, impalpable paste is obtained; then the remainder of the basis is added gradually, sweeping the sides of the mortar and pestle from time to time with a spatula, so that all is thoroughly mixed. Often, however, it will be necessary to add something to facilitate the grinding before adding the ointment: thus, if camphor is ordered, it must be rubbed very fine by the aid of a little spirit which evaporates during the mixing. If an extract

is to be added to an ointment it is first put into the mortar and rubbed to absolute smoothness with a little spirit, water, or glycerine, before adding the unctuous basis. If the extract is hard, or even of pilular consistence, the best plan is to previously warm the mortar by pouring hot water into it, and dry quickly with a cloth, when the extract can be rubbed to smoothness before a little of the basis is added. Soluble crystals, like iodide of potassium or carbonate of potassium or sodium, are triturated with a little water before adding the remaining ingredients. Iodine should be rubbed to powder, a few drops of spirit added, and the trituration continued. Iodide of sulphur should be most perseveringly rubbed down with a little olive oil, borax with a little glycerine, and red precipitate with distilled water.

Volatile liquids should be added after the other ingredients are well mixed, so that evaporation is reduced to a minimum, as in the case of Prussic acid and chloroform.

Steel knives should not be used in the preparation of ointments with the alkaloids, or with acids, or especially with the acid nitrate of mercury, red precipitate, or yellow oxide of mercury ointments, which are ruined by the touch of iron. Many fine and pearly compounds made with cold cream are well prepared by mixing them up in a china cup with a silver or gilded spoon, and it is a safe rule for the young dispenser to use a bone or boxwood knife in making all ointments.

This is not intended as a complete list of the difficulties and their remedies in ointment making ; but the writer has deemed it wise to enter more fully into the subject than its simplicity might apparently warrant, for just because the preparation of this class of compounds appears to be very easy, so are they often carelessly compounded, to the vexation of the physician and the annoyance of the patient. It is not at all an uncommon thing to see sores irritated and eyes inflamed by the very remedies prescribed to soothe them, the coarse angular particles acting like so many little setons. It is hardly necessary to say that any ointment with the least trace of rancidity should not be compounded by the dispenser.

When the mixing has been finished the ointment is scraped out of the mortar with a bone or wooden spatula, and generally dispensed in covered porcelain pots, and unless of very firm consistence, a piece of waxed paper should be inserted between the ointment and the lid, and pared neatly round. If it is at all approaching the fluid state a wide-mouthed bottle will be the best vessel. Occasionally, for the poor and in hospital, the common chip box is used.

CHAPTER VIII.

COMPOUNDING OF SUPPOSITORIES AND PESSARIES.

SUPPOSITORIES are seldom ordered except in the Pharmacopœial form; but, as even these should be prepared by the dispenser himself, a passing notice may be made of their preparation. They are generally made in conical moulds, should weigh about 15 grains each, having cacao butter for their basis, and such other firmer substance, to enable them to solidify rapidly after being poured into the moulds; this latter *desideratum* is assisted by having the moulds made of a massive block of gun-metal which causes their rapid cooling (Fig. 15). The ingredients should be treated as if an ointment was to be made; any powder or crystalline substance being rubbed to fineness with a little lard or a trace of the butter in a mortar or on a slab, whilst the remainder of it is being melted in a small cup on a water-bath with the wax; only enough heat

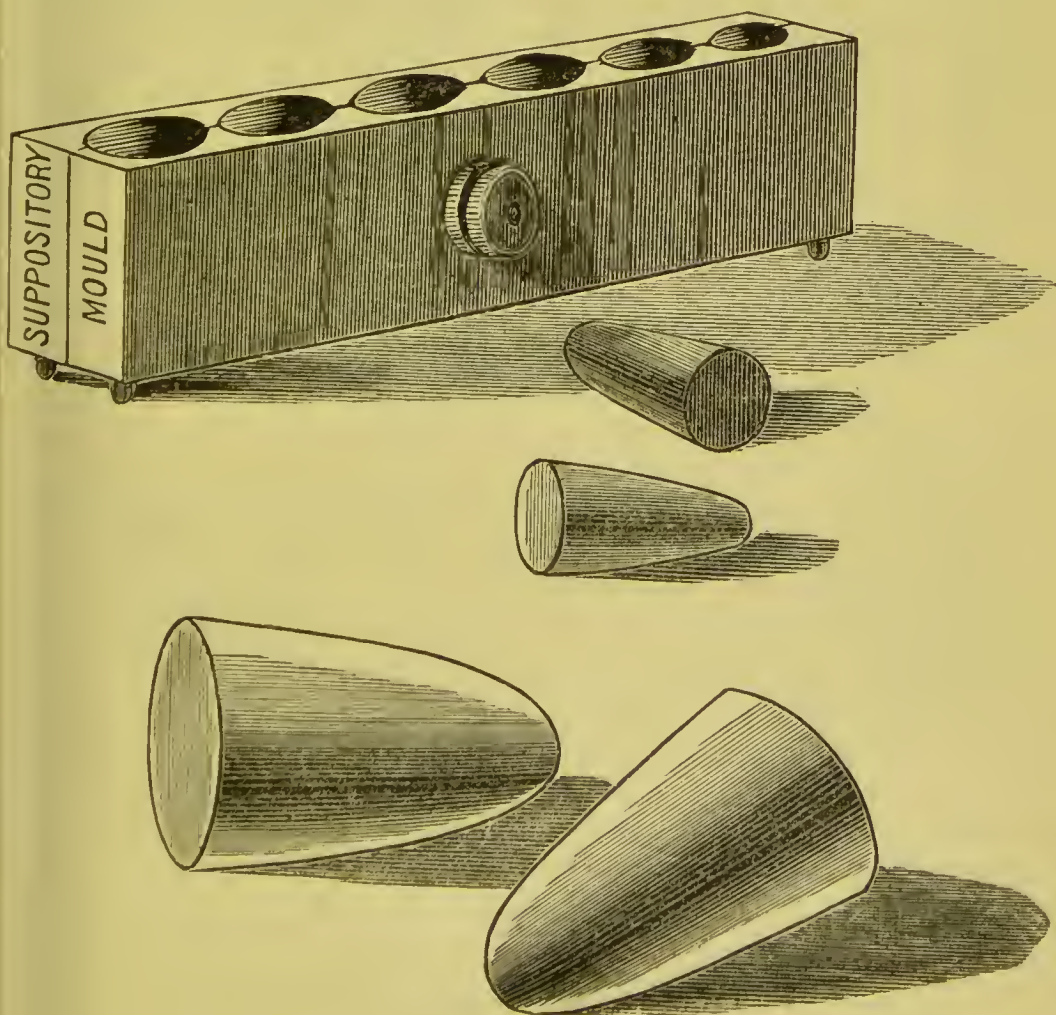


Fig. 15

must be used as will barely melt them, and when they begin to show signs of congealing the triturated ingredients may be added with a teaspoon, and stirred constantly till a creamy mass is obtained, which is to be poured into the moulds with the teaspoon. If the moulds are previously dipped in ice water, or in a little freezing mixture, made by dissolving sal ammoniac in water, the subsequent detachment of the congealed substance will be expedited. This latter part often gives trouble, the suppositories persistently adhering to the mould; various plans are tried, and the simplest would be to wet the interior of the mould with water, but water will generally run off it in drops; breathing into it often answers, or dusting over the surface with lycopodium and blowing out the excess; but by far the best method is to smear over the interior with soap liniment. Spermaceti will be found a more satisfactory addition to the cacao butter than wax, as, owing to the rapidity of its congealing, the mass is not so liable to adhere; oil applied to the interior of the moulds is liable to cause the suppositories to stick fast.

In the case of alkaloidal salts and watery extracts a more suitable basis than cacao butter will be found in the following Gelatine Basis:—1 oz. pure gelatine should be rapidly washed in a little cold water and left to soak for about one hour in 3 oz. water; glycerine 3 oz. by weight is then added and the mixture thoroughly incorporated on a water-bath till the weight is reduced to 5 oz. The melted mass, after being skimmed, is then poured into a wide-mouthed stoppered bottle, and when cold covered with a layer of alcohol. The basis when required is melted with the alkaloid or extract in a small evaporating dish and poured into moulds previously greased with a little oil. The same plan may be employed in making the next class of preparation. Ergotine, Cocaine, and Hazeline make elegant masses with such a basis. The relative proportions of glycerine, water, and gelatine may be varied to suit the amount of aqueous medicament.

Pessaries are made in precisely the same way, only they are from three to eight times larger (Fig. 15), generally weighing about one drachm, and made in larger moulds of a similar shape. If a very small pessary is ordered, it may be made as two suppositories fused at their bases, forming a double core, and this shape answers well when it has to be moulded by the fingers.

Both suppositories and pessaries should be dispensed in small square cardboard boxes, with cotton wool; or, in the absence of these, in large pill boxes; and the directions for their use should be plainly given by the physician, or written

on the box by the dispenser—as sometimes in ignorance they are swallowed.

Pessaries and Suppositories, containing Green Extracts, may be readily made by first rubbing the extract with a few drops of warm water till of a creamy consistence, adding $\frac{1}{3}$ the oil of theobroma, rubbing again till smoothness, and adding the mixture to the remaining $\frac{2}{3}$ of the oil heated; after thorough incorporation and further heating, if necessary, the mass may be poured into moulds.

CHAPTER IX.

DISPENSING OF BLISTERS AND PLASTERS.

BLISTERS are generally spread upon adhesive plaster. In the case of public charitable institutions, they may be spread upon brown paper; but, unless directed otherwise, they should always be put upon the adhesive plaster, which is itself spread upon thin glazed calico, and sold in rolls of a yard each. The twilled calico, swansdown, and other fabrics, as a rule, are not so suitable. The dispenser takes the size of the required blister,

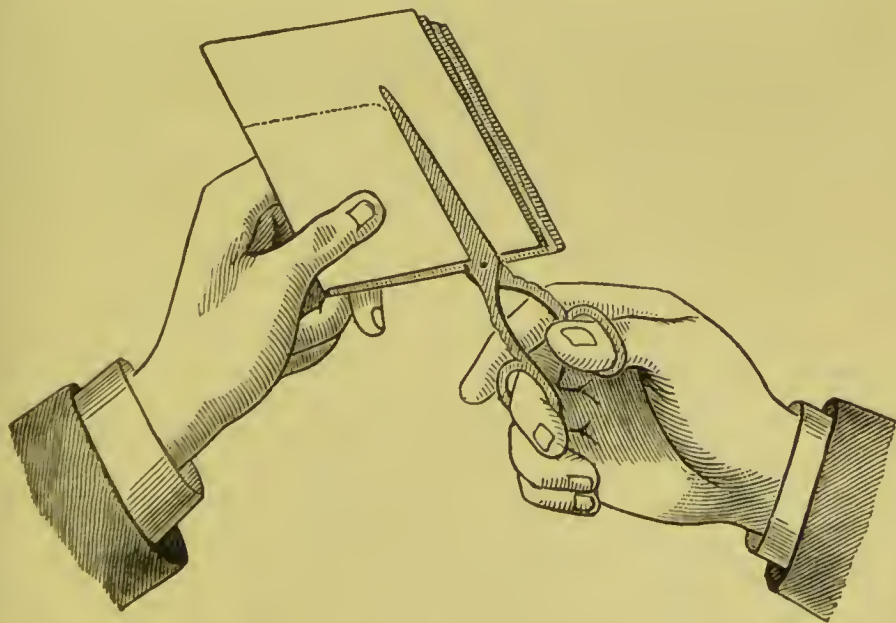


Fig. 16.

which is commonly oval or square, and prepares a "shape" by folding a square piece of waste writing or wrapping paper twice upon itself, and with a pair of scissors he cuts the form and size of the blister out of the middle of this, rejecting the cut out centre (Fig. 16).

He has now an exact shape (Fig. 17), the inner margin or edge of which is the same size and form as the circumference of the required blister. (This is precisely the same manner in which plaster shapes are made.) A piece of the thin sheet of adhesive plaster is cut about one inch larger than the blister, and gently warmed, only enough heat being used to make it *slightly* sticky; it is then quickly laid upon some firm smooth surface, and the shape pressed upon the adhesive side—where it should evenly adhere, but only to such a degree that it readily

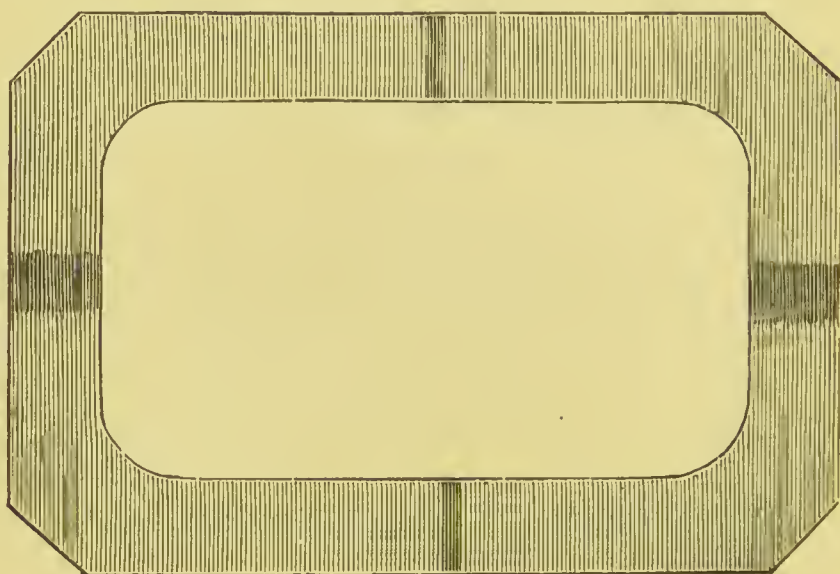


Fig. 17.

separates when pulled off. All is now ready for the spreading process, which should be accomplished by the thumb alone. The cantharides plaster of the Pharmacopœia is well adapted for this. A piece about the size required is kneaded between the fingers until *uniformly* softened throughout, when the dispenser, steadying the shape and plaster with the fingers of the left hand, spreads a piece about the size of a bean with the side and front of the last joint of the right thumb, beginning at the corner next him, and continuing in a series of rainbow strokes till the plaster is covered (Fig. 18).

A long spatula, not unlike a dinner-knife, warmed so slightly that its temperature can be borne by the skin when pressed against the cheek, should now be firmly passed over the blister, removing superfluous plaster and making its surface smooth and even. Some dispensers previously sprinkle a few drops of blistering liquid, or olive oil, over it to improve its appearance—but this is not necessary. The paper shape is now peeled off the plaster, and the edges trimmed neatly with a *large* pair of scissors, allowing a margin of plaster about

three-eighths of an inch wide to remain ; a piece of waxed or oiled paper is laid on its surface, and the whole enclosed in a paper box or envelope. The dispenser or physician should be careful to direct that this paper be removed before application, as blisters and plasters have sometimes been rejected as useless, the paper never having been removed. Instead of cutting the piece of plaster for the blister off the roll, the experienced spreader may lay the shape on the roll itself, thus saving the clippings, as shown in the Figure.

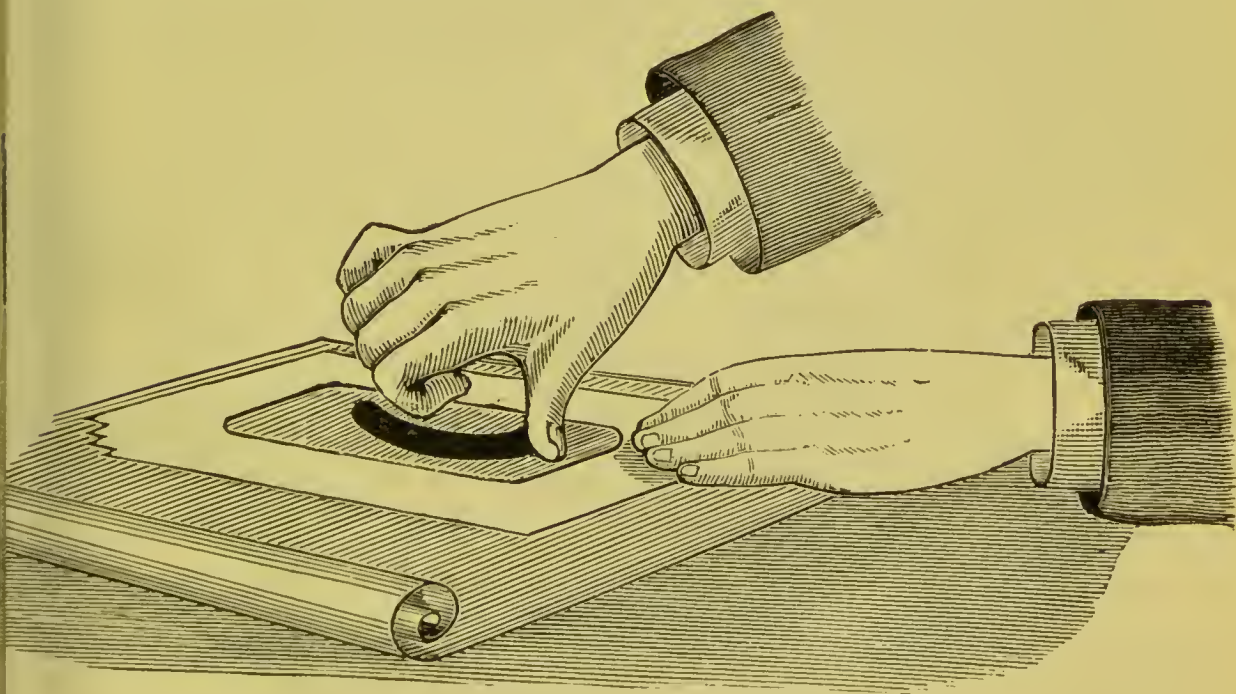


Fig. 18.

Plasters are more difficult to spread, since they require heat, and they are often liable to be burned, creased, or uneven ; and the dispenser who can spread a plaster properly will be always found to be one who can perform every other duty of the art of compounding satisfactorily ; hence it may be looked upon as the test of pharmaceutical accomplishment to be able to perform this operation neatly and excellently. Plasters are generally spread upon sheep-skin or stiff chamois, and sometimes over adhesive plaster which has been already spread upon linen, dimity, or moleskin ; but when the physician simply orders a plaster without specifying the fabric upon which it is to be spread, he means it to be dispensed on the white sheep-skin which is kept by every dispenser. The same steps are gone through exactly in cutting the shape as if for making a blister ; a piece of leather somewhat larger than the size of the intended plaster is cut off the skin, and pulled in different directions gently, to make sure that it will not yield

operator, and sweeping round the far margin in a series of half ovals, watching the borders and corners, "for the centre will take care of itself." (Fig. 20.) Towards the end, when the leather is covered, the flat face of the iron may be used to smooth all irregularities; and, after a moment's delay, during which the plaster hardens, the shape may be pulled off, and the borders of the leather trimmed; in a medium sized plaster at least three-quarters of an inch of border should be left. One iron will not do all this; and before beginning, two should be selected; the second may come into use about the time the plaster is being transferred from the paper to the leather. If the plaster were melted directly on to the leather, as some advise, a mess would probably be the result.

Sometimes a plaster with an *adhesive* margin is ordered to be spread on leather, and it is a more troublesome process than the above. It may be done in this way:—The shape is cut as described, and the centre piece, instead of being thrown aside, is damped, and pressed against the middle of the leather; the shape is taken, folded up again, and a piece cut out of it for the entire extent of its inner margin—thus enlarging it by the width of the intended adhesive margin; it is then stuck to the leather, leaving a space between its inner margin and the central piece of paper, which space is to be spread over with adhesive plaster, both papers pulled off, and the vacant central part covered over with the plaster as ordered, the edge trimmed, the surface loosely covered with a piece of waxed paper, and dispensed in a flat paper box. The dispenser, until he has acquired great practice at spreading plasters, will be unable to finish the inside space without a shape; and he may achieve all that is required in this way:—The leather to be covered with plaster is laid down flat as before, and, with one good circular sweep of a large iron, its circumference is surrounded with a margin of adhesive or resin plaster; when this is cold, the shape, cut as before to the exact size of the plaster required, is laid down on the leather and attached, by means of a little soft soap, to the adhesive marginal surface. The plaster, having been mixed as previously directed on a separate bit of paper, is rapidly spread, as if there were no adhesive margin in the case, the shape is now torn off and the adhesive border trimmed. The student will observe that if these directions are followed he will have no plain margin outside the adhesive one, and seldom is such deemed necessary, so that this latter method is, on the whole, the better one for him to learn.

CHAPTER X.

GENERAL HINTS TO THE DISPENSER.

IN our limited space we can only give a very few additional hints to the student of Pharmacy upon such matters as do not naturally fall under the previous chapters. It is hardly necessary here to remind him that upon his simplest manipulations hangs the life of the patient, and though this solemn sense of his responsibility should be ever before his mind, it should not be allowed to paralyse his exertions, or tend to render him "unpractical." Overconfidence is a fruitful source of mistakes in Pharmacy, as it is in other departments, and the pharmacist must be cautioned against falling into the habit of working mechanically or automatically, so common amongst the absent-minded. It is a frequent occurrence, for example, to see a dispenser walk in an automatic way up to a well remembered place where a bottle has always stood, lift it from its shelf, and pour out its contents without looking at the label. If the student should find himself falling into this habit, his remedy is to occasionally remove the bottles and occupy their places with others unmistakeably different in shape and size.

Artificial Waters should not be employed, as they are wanting in the fragrance of the distilled preparations.

Solutions.—As quickness and despatch are generally considerations in Pharmacy, it is advisable to keep some of the more frequently prescribed salts in solution ; and a few hints as to the most convenient strengths of these solutions may not be out of place here.

Alum, $2\frac{1}{2}$ ozs. (Troy) dissolve in 1 quart of distilled water ; each ounce of the solution representing half a drachm of the salt.

Bicarbonate of Potassium, 1 ounce (Troy) dissolved in enough distilled water to measure 4 ounces, makes a very suitable stock solution, as half an ounce of it contains one drachm, or 60 grs. of the salt.

Chlorate of Potassium, 1 in 24, made in the same way, is the best strength to suit all variations of temperature. The salt is soluble in a smaller quantity of water, but is apt to crystallise with changes of temperature.

Epsom Salt, 1 in 2 ; **Bromide of Potassium**, 1 in 3 ; and **Chloral Hydrate**, 1 in 1, make very convenient solutions, the latter particularly so, each minim represents one grain of chloral, and it is fairly stable and easily calculated.

Official Pill Masses.—Some of the official pill masses become very hard on keeping, and get so brittle as to be unmanageable ; they may, with great advantage, be kept in the dry state, the powdered ingredients being mixed together, so that the menstruum ordered in the Pharmacopœia to give consistence may be added at the time of dispensing. In this way Pil. Colcocy. Co., Pil. Aloes Barb., and Socot., Pil. Aloes et Ferri, and Pil. Hyd. Subchlor. Co. may be kept with the required proportions of the requisite menstruum marked on the bottles in which they are contained. This plan is often a great help if the physician happens to order too soft a mass.

Syrup. Ferri Iodidi for dispensing may be kept in the form of the liquor without decomposition or discoloration if a minute quantity of hypophosphorus acid be present to prevent oxidation. It can be made exactly to correspond with the official syrup by adding the requisite amount of sugar.

Mistura Ferri Co. can also be kept in a concentrated form, so that every drachm will contain the constituents of an ounce of the mixture, except the sulphate of iron, which is to be weighed out and added the last thing before dispensing.

Mistura Ammoniac. may be kept in concentrated form so that 1 drachm of the liquid will represent 1 oz. of the official mixture.

Mist. Cretæ can be easily kept in powder, ready for the addition of cinnamon water.

Concentrated Infusions and Decoctions, so often employed by pharmacists for convenience, are to be condemned. *These preparations should always be made fresh as required.*

Substitution.—It cannot be too strongly impressed upon the student's mind that substitution should never be practised. By substitution is meant the using of an equivalent quantity of one preparation of a drug for that of another ; say for instance, infusion of cinchona is required, it would be absolutely wrong to use an equivalent quantity of the liquid extract, as it is more than probable that this latter preparation does not contain the full quantity of alkaloids that an equivalent quantity of bark in the infusion does. The student of Pharmacy never should depart from the strict observance of the Pharmacopœia.

Unofficial Nomenclature.—Often the dispenser will be at a loss to understand the meaning of the prescriber, when he orders some preparations out of their official names, and he then must have a consultation, or fall back upon the experience of himself or others. A few examples may be given :—When Magnes. Calc. is ordered, Magnesia Ponderosa B.P. should be used ; when Magnes. Carb. the *heavy* preparation is

usually intended ; when Bismuth., or Bismuth. Alb. is prescribed, the subnitrate is the preparation generally in the mind of the physician ; when Æther. Chlor. is ordered, it is best not to dispense "chloric ether," but Spirit of Chloroform B.P.

Liq. Morphiae is very often written in a prescription, and the dispenser will do well to employ Liq. Morph. Hydrochlor. When Extract. Aloes is written, the rule should be to use the Socotrine.

Much confusion unfortunately exists in the memory of some prescribers about the mercurial chlorides, and fatal consequences have resulted. The Subchloride is often written Hyd. Chlor., Hyd. Mur., Hyd. Submur. and the Perchloride is occasionally prescribed as Hyd. Chlor., or Hyd. Bichlor.

If the dispenser find it impossible to consult the physician in such cases, he will not regret giving the subchloride, if more than $\frac{1}{8}$ grain is ordered in each dose.

It will be well to remember that Hydrate of Chloral is sometimes carelessly written Hyd. Chlor.

Loose or Dry Ingredients. — Roots, crystalline salts, leaves or seeds, when prescribed in the crude state by the physician, should be cut, chopped or bruised so as to alter their physical characters and prevent their being easily recognised by the patient.

Incompatibility.—When the pharmacist gets a prescription where incompatible substances are ordered it is clearly his duty to compound it, unless *absolutely* incompatible, in which case the different ingredients will not mix, and, if possible, then he should consult the prescriber. Instances of such might be given to fill a large volume, and, unfortunately, no rule can be laid down for the guidance of the young dispenser, as it is still an open question with pharmaceutical authorities whether a compounder is justified in altering a prescription, suppose he find the emulsifier or pill excipient ordered by a medical man unsuitable. Much will depend upon his knowledge of the prescriber ; if he is satisfied that the incompatibility was known to him, it is clearly his best rule to follow the written law of the prescription, and carry out rigidly the intention of the prescriber. But if upon the other hand, the chemical action (inevitable upon the mixing of the ingredients) was *evidently unintentional*, the dispenser will be justified in averting it by any means at his disposal. If the incompatibility produces such a change in the ingredients of the prescription as would probably risk the life of the patient, the dispenser should not compound it without a consultation. An example of such incompatibility may be instanced in the case of compounding chlorate of potassium with syrup of iodide of iron, the free

iodine and chlorine liberated having proved fatal when the mixture was administered.

Iodide of potassium is easily decomposed by nitric and most other acids, which after a time liberate free iodine, which, falling as a sediment, may be taken in such a dose as would prove fatal.

It is not an unusual mistake to order in tertiary syphilis large doses of iodide of potassium along with full doses of tincture of perchloride of iron; free iodine is precipitated, and in a concentrated mixture of this kind has caused death. A very dangerous combination has been occasionally prescribed when free iodine or a strong liniment has been ordered with solution of ammonia or compound camphor liniment; the precipitated iodide of nitrogen is a most dangerous explosive. Reference has already been made to the explosive nature of pills containing oxide of silver and creasote; they have taken fire and caused serious injury to the patient. Fatal results have been reported in several instances where alkalies have been ordered in mixtures containing strychnine, as this alkaloid is precipitated by alkalies, and the last few doses containing the greater part of the insoluble strychnine have been swallowed and have killed the patient. Strychnine is also thrown down by bromide of potassium, and the insoluble bromide has in the same way caused death.

Looking at the question from the physician's point of view, the writer thoroughly endorses Mr. Ince's opinion:—"We have no right to expose a patient to the risk of imperfect combination, and here as a dispenser, I would act upon my own responsibility. The interest of the physician is best served by the dispenser who is a sentient being, and not an automaton."

Poisonous Doses, or doses which may strike the dispenser as decidedly risky to the patient's life, should not be dispensed unless the dispenser happens to have some evidence that such is within the prescriber's knowledge. If, for instance, the poisonous dose was *underlined*, *initialled*, &c., or as it is usual in Germany, followed by a note of exclamation, the dispenser can, without hesitation, send it to the patient.

We may conclude these necessarily brief suggestions on extemporaneous Pharmacy by quoting the following guiding rules for the Pharmaceutical student from the *Chemist and Druggist's Diary*, 1885. They epitomise the principles laid down in the foregoing chapters:—

"1. Read through a prescription, rapidly and in a manner suggesting no suspicion of doubt. 2. Write directions invariably before dispensing. 3. Avoid thus the use of blotting paper. A good dispenser uses almost none. 4. If a mixture contains

readily soluble ingredients, never use a mortar. Avoid effecting solution by heat, for fear of recrystallisation. 5. With syrups and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean. A skilled dispenser shows very little traces of his work. 6. Carefully clean and put away weights and scales after each operation. 7. Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale. 8. Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate. 9. Learn to judge of the quantity to be weighed with tolerable accuracy; train the eye as well as hand. 10. If in doubt, always begin with that in which you have no doubt. 11. Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge. 12. Never, when in a shadow of a doubt, hesitate to ask advice from a fear of compromising your own dignity."

CHAPTER XI.

OFFICIAL PHARMACY AND THE PHARMACOPŒIA.

THE *British Pharmacopœia* is published under the supervision of the Medical Council, and undergoes revision at irregular intervals. It may be regarded by the pharmacist as having all the authority of an act of Parliament. The drugs, tests, and processes mentioned in it are said to be "Official" or "Officinal." The following pages will briefly describe the chief pharmaceutical processes referred to in it. The student will probably discover that many of these are but repetitions of processes already practised by him in the chemical laboratory—as precipitation, crystallisation, &c.; others, however, will be found to be peculiar to Pharmacy—as percolation, infusion, &c.; and it will be advisable for him, before entering upon the study of the various preparations, to glance at a few of these more important processes—especially to those that are common to many groups of preparations, as—

Affusion or Ablution—by which is meant the pouring of water on any substance to cleanse it of its impurities. In the washing of a precipitate, for example, the student is directed to pour cold or hot water upon it, shake or stir briskly, allow the insoluble part to fall to the bottom by rest, and then to pour or draw off the supernatant liquid. In the *British Pharmacopœia*

these simple operations are respectively dignified by the names of *Affusion, Agitation, Subsidence, or Deposition, and Decantation.*

Analysis—In the Pharmacopœia both the *qualitative* and *quantitative* methods are frequently directed to be employed ; and of the latter sometimes the *volumetric* and sometimes the *gravimetric* process is made use of.—(See “Testing.”)

Baths—Sand, water, and steam are mentioned under Fusion.

Boiling or **Decoction** is largely employed in the manufacture of various decoctions, extracts, syrups, &c. Generally the directions are, that the article to be decocted is to be put into a covered vessel with cold water, and allowed to boil on the fire for a given time. If, say, a quart of water, with the substance in it, is to be boiled down to a given quantity, as a pint, then the decoction is a mixed method of boiling and concentrating by evaporation, and an uncovered vessel is selected ; decoction of pomegranate is made in this way. The process of making extracts is quite different ; here the evaporation or boiling is performed after the drug is separated from the original decoction, juice, or infusion. **Ebullition** is the ordinary chemical term for boiling, and is occasioned by the formation of bubbles of vapour within the liquid, which rise to the surface like gas bubbles. Decoction, strictly speaking, is the ebullition of a liquid containing some vegetable substance whose virtues are to be extracted by the boiling liquid.

Bruising or **Contusion** is a process by which soft, elastic, or ligneous substances have their structure broken up before being subjected to the action of a solvent by infusion or maceration. It is employed to break down the cohesion of fibrous roots, and is applicable to all tough drugs, like ergot, cloves, asafoetida, &c., and to fresh leaves and young juicy branches. The article to be bruised is put into an iron or strong stone mortar, and, with a straight up-and-down movement of the pestle, it is bruised, crushed, or pounded till the requisite degree of destruction of tissue is obtained, a little only being operated on at a time. The same object is often attained by cutting.

Calcination or **Incineration** is the process of exposing a substance to a high heat, so that water and volatile matters are driven off, or oxygen absorbed, and the residue left in a finely-divided powdery condition. The process is carried on by placing the substance to be calcined in a Cornish, Hessian, or other crucible, which is placed in a furnace. In this manner the Pharmacopœia directs magnesia and lime to be prepared from their carbonates.

Clarification or **Depuration** is the purification of a substance, generally a liquid or semi-solid, by extracting its impurities, as in the case of honey, lard, suet, &c., by melting or heating, and, whilst fluid, straining through some texture like flannel. It is a modification of the process of filtration.

Crystallisation is the process which bodies undergo in passing from the liquid or gaseous state to assume definite and regular geometrical forms, called crystals. This process is generally directed to be carried out by the cooling or evaporation of a solution containing the substance to be crystallised, or more rarely it is ordered to be effected by fusion, as in the case of some metals and sulphur; by sublimation, as benzoic acid and corrosive sublimate; or by precipitation, as in the instance of the red iodide of mercury. In obtaining crystals by evaporation the liquid is either boiled till its volume is reduced by the loss of vapour, or it may be kept at a lower temperature than the boiling point for a longer time till the same effect is produced, and when the concentration has proceeded so far that a scum or pellicle forms on its surface, the liquid is set aside to cool, and as the temperature falls crystals form. When they have ceased to grow or increase, the fluid part, which is now called the "mother liquor," is poured off, and the crystals drained and dried. A second or third crop may be obtained from the mother liquor by further evaporation and cooling, as in the first instance. The process is hastened by the presence of foreign bodies, as threads or sticks, round which the crystals quickly gather; or by agitation, when the crystals will be found to be small. The slower the process the larger and more regular will be the crystals, and it is advisable not to evaporate just so far as the Pharmacopœia directs usually for most of its salts. The six systems of crystals are all well represented in the Pharmacopœia.

In the case of some salts like alum, carbonate of sodium, and sulphate of iron, the water of crystallisation, which the salt carries down with it on assuming the solid form, is directed to be expelled by heat, thus increasing the strength of the substance by the weight of the water lost, which ranges generally from $\frac{1}{4}$ to $\frac{3}{4}$ of the original salt; thus dried sulphate of iron is nearly twice the strength of the crystals.

Decoloration—a process by which substances like the alkaloids Morphine, Atropine, &c., are deprived of colour—consists in treating a solution or mixture of the substance with powdered charcoal and filtering. Purified animal charcoal is directed to be used.

Despumation is the name given to the process by which many organic liquids are purified by the application of heat, when the impurity rises to the top as a scum, and is easily removed by skimming or by filtration. Though not directly mentioned under this name in the Pharmacopœia, this process is extensively employed, as in the making of the green extracts, and the practical pharmacist finds that the syrups made with organic liquids, like the majority of the official ones, keep much longer by being despumated. This is the more necessary as it is difficult to find sugar perfectly pure and free from organic adulteration.

Desiccation is the name given to the process of drying drugs.—(See under "Drying.")

Dialysis is the process by which crystalloids are separated from colloids by passing the liquid containing them through an animal membrane like parchment. The dialyser is floated upon the surface of water and the crystalloids pass through as in the preparation of solution of dialysed iron.

Digestion is one of several allied processes often confounded. It means the prolonged treatment, at a heat elevated, but below the boiling point, of a substance (such as a powdered root) in the liquid intended to dissolve out its soluble principles. It is the same as maceration at a higher temperature than that of the air.

Distillation is the process by which a liquid is converted into a vapour on the application of heat, and the vapour is condensed into a liquid again in a separate vessel. The variety of apparatus for the process is endless. The simplest would consist of a closed vessel called a retort, from the top of which a long tube leads to a receiver. On partially filling such a vessel with volatile liquid, and applying heat till boiling, the vapour of the liquid would fill the upper part of the vessel and tube, during its passage through which it would be cooled or condensed, and drop into the cold receiver as a liquid. The object of distillation is to combine volatile substances which cannot otherwise be mixed, as in the preparation of the waters, or to separate mixed volatile and fixed substances, as in making Spt. Ammon. Fœtid., or to separate impurities from the liquid which could not be got rid of otherwise. Distillation is a mixed process, consisting of ebullition—by which, in the first instance, the volatile substance is converted into vapour—and of condensation, by which the vapour is again changed into a liquid.

Destructive or Dry Distillation is the process by which a body is decomposed by heat into volatile products which did not previously exist in it, the products being collected in a

separate vessel, as in the production of acetic acid and tar from wood.

Fractional Distillation means the distilling of a mixture of substances volatile at different temperatures, whereby they may be separated and received into different vessels by regulating the temperature.

Drying is a process used in the preparation of a great many remedies. There are, however, no official directions given for the drying of roots, leaves, seeds, &c.; these are generally submitted to a uniform temperature, after being spread out on shallow trays or drawers of network, in a room, heated by steam or hot water pipes. The best heat is one ranging between 100° and 130° F. Many plants which are used in Pharmacy are dried simply by exposure to the sunshine of their native country, but this is not practicable in our latitude. Flowers should be allowed to dry spontaneously. Fleshy roots should be transversely sliced before being placed in the drying room. Crystals and precipitates, as a rule, stand higher temperatures, and may be dried on a water bath. Others require still higher temperatures, especially when we aim at the expulsion of the water of crystallisation, as in drying alum and sulphate of iron—where a heat of nearly 400° is required. On the other hand, some salts, like the valerianate of zinc, must be dried at the ordinary heat of the surrounding atmosphere. Carbonate of potassium and slaked lime recently heated are used to absorb the water from alcohol, freshly burned lime from ether, whilst sulphuric acid is used in various drying processes.

Elutriation—The process of powdering rough insoluble substances like chalk, ores, &c., and mixing them with water, so that the finer, light, powdery portion may be poured off after the coarser particles have fallen to the bottom. It is done sometimes merely to wash away such impurities as sand, gravel, &c.; in its results it resembles sifting.

Expression is the process by which the juice or oil is squeezed out from vegetable substances, and the tincture or spirit from the marc after maceration or percolation. It is performed by putting the substance into a suitable press, and by mechanical power separating the solid from the liquid portions. Oils so obtained are called expressed or fixed oils, to distinguish them from volatile or distilled oils.

Evaporation is the process by which the volume of a liquid is reduced and its volatile constituents driven off by a heat ranging between that of the air and the boiling point of the liquid. It is employed in the making of extracts, in the crystallisation of salts, and many other operations in Pharmacy.

The vessels used should be very shallow, and present a large surface of the liquid exposed to the air. In evaporating vegetable juices and infusions, a moderate heat should be employed—say about 140° F. The nearer the liquid is kept to the boiling point the quicker the evaporation; and small quantities only of vegetable infusions or juices should be subjected to the process, and in separate batches, which can be evaporated down still further if necessary—thus preventing deterioration by long heating. Stirring quickens the process, and the heat may be regulated by the use of a water, steam, or sand bath.—(For which see “Fusion.”)

Filtration is a process by which we separate an insoluble matter or sediment from a liquid, by causing it to flow through the pores of blotting paper, flannel, felt, calico, or linen, the liquid after passing through being clear and bright. *Straining* is a quicker, but rougher process of the same nature, for the removal generally of *visible* foreign particles, by causing the liquid containing them to pass through the open meshes of muslin, tow, wool, asbestos, or wire netting. If a liquid is *perfectly* transparent, and offers no obstacle to the passage of light, it is said to be “bright,” though it may be highly coloured. All tinctures should possess this quality; and if they do not, repeated filtration, and rest, will brighten them. In the case of very dark liquids, they should also be bright when examined in *minute* quantity by transmitted light. Opposed to this condition we have that of “muddiness,” which is often an opprobrium to the pharmacist; it is caused by the presence of *invisible* particles in a state of suspension, producing translucency. A mixture or liquid is said to be “clear” when no *visible* particles of foreign matter are detected in it; hence a liquid may be bright, but not clear, if it contain a few coarse particles floating through it and is otherwise transparent. The treatment for muddiness or opalescence is Filtration; to produce clearness, *Straining* is the remedy.

Fusion, Liquefaction, or Melting, is the process by which solid bodies are rendered liquid by the application of heat; it is largely employed in making ointments, plasters, caustic sticks, and in purifying resins, and for the purpose of decomposition—as in making Potassii Permang. The substances are put into a suitable vessel and heat applied, varying from a temperature of 90° , sufficient to melt lard in an open jar, to one of 800° for fusing zinc in an earthen crucible. The water, steam, and sand-baths are frequently employed. The *water-bath*, consists of an apparatus by means of which water, or its vapour, at a temperature not exceeding 212° , is applied to the outer surface of a vessel containing the substance to be heated. In the *steam-bath*, the

vapour of water at a temperature above 212° , but not exceeding 230° , is similarly applied; and in the *sand-bath*, a vessel partially filled with fine sand is placed upon the top of a stove or on the open fire, and the substance to be heated in a jar or crucible is thrust down into the sand; it differs from the steam or water bath in not limiting the degree of heat, and is no safeguard against any high temperature being reached; but it effectually prevents sudden changes in the heat, keeping the substance at a uniform degree. Since alkalies and oxide of lead attack silicious substances, for them, iron or silver crucibles must be used. Platinum also is attacked by alkalies, though very feebly.

Gathering of Plants, &c., should be effected, when possible, in sunny weather, and at the time specified in any particular case in the Pharmacopœia. Generally, roots of annual plants should be dug up *before* flowering; and perennial roots should be gathered in winter or very early spring, as soon as the first leaves show themselves above ground, and not till plants are two or three years old at least. Rhubarb should be six years of age. Leaves should be gathered before they begin to change colour, and those of biennial plants not till the second year—as hyoscyamus for example, collected in the first year of its life, is almost inert; some are directed to be gathered when the plant has two-thirds of its flowers expanded, others when the fruit begins to form.

Barks should be collected when they come off most readily from the wood—*i.e.*, from trees in the spring and from shrubs in the autumn. Flowers should be gathered when about four-fifths expanded; the red rose, however, is collected in bud, otherwise it loses its astringency and colour; and the flower-buds of the clove become almost devoid of aroma if allowed to expand. Fruits and seeds, generally, are collected when ripe; but the pimento, pepper, bael, and others, are exceptions.

Granulation is the process by which a coarsely crystalline salt is reduced to the condition of a granular powder, by dissolving it in water and evaporating the solution—incessantly stirring till the product becomes dry. Carbonate and citrate of potassium are thus made, and sometimes substances which can scarcely be reduced to powder otherwise are treated in this way, such as sal ammoniac and nitre. Sulphate of iron is granulated by filtering a solution of it into rectified spirit, which is to be kept constantly stirred, so that the crystals which form will be very minute.

Infusion is the process of extracting from a body, commonly of vegetable origin, its virtues or soluble parts, by treating it for a short time with water in a covered vessel, the substance being first reduced to a state of moderate subdivision or coarse powder; generally water in the act of boiling is used. Sometimes, as in the case of cusparia and chiretta, water at a lower temperature is

ordered, and cold water is used to extract the virtues of calumba, in order to avoid dissolving the starch contained in it. Quassia yields up its bitter principles to cold water. As a rule, the subdivision of the substance need not be carried to the same extent as for tinctures.

Levigation is the name given to a process like elutriation, in which an insoluble substance is *ground* into powder in presence of water or some liquid in which it is insoluble, the finer parts washed away and collected, the coarser being returned for further grinding with water, and so on till a fine powder is obtained. Red precipitate may be thus reduced. Elutriation is applicable to cheap, coarse materials, like chalk and ores, where the refuse is not ground, but rejected.

Lixiviation is the process of acting upon a compound or mixed solid, with water, in order to dissolve out a soluble salt, the solution being poured off the insoluble residue and evaporated, as is done in the preparation of pearl-ash from wood-ashes.

Maceration is the process of steeping or soaking at the ordinary temperature of the atmosphere a substance in a liquid capable of dissolving some of its soluble constituents. The liquid is called the *menstruum*, and the rejected matter, which is insoluble, is spoken of as the *marc*. Several tinctures are directed to be prepared in this way. It differs from digestion in being carried on generally for a much longer time, and without heat, and spirit is commonly the *menstruum*. The drug should be previously reduced to a proper state of comminution by bruising, cutting, or powdering.

Percolation or **Displacement** is one of the most important processes in Pharmacy, being extensively used in the preparation of tinctures. It consists in packing into a short wide tube, closed at one end by tying a piece of calico over it, the substance, in a state of coarse powder, whose virtues are desired to be extracted, and pouring into the tube the *menstruum*—generally proof spirit. As the spirit filters its way through the column of powder it dissolves out the soluble parts, and drops finally into the receiver below as a bright tincture. The process may thus be defined to be the “filtration of a liquid through a porous column of a powdered material, so that it may extract its soluble matter.” It is not adapted to gummy or adhesive substances, but possesses the great advantages over maceration in being quicker, and in the fact that after the fluid has ceased to drop, the tincture still left in the tube can be displaced by pouring in more spirit or water on the top of the *marc*. The mixed form of first macerating and then percolating, which is generally directed for the manufacture of tinctures, is decidedly better than either

process used separately. At the bottom of the tube, immediately over the calico, a layer of fine pebbles or coarse river sand prevents the powder closing its pores (Fig. 21).

Great skill is required in carrying out the process of percolation, and much depends upon the degree of comminution which the substance receives. If the powder be too fine, it gets into a cake, and prevents the passage of the spirit; and, if too coarse, the spirit runs between the particles without dissolving out their active properties, flowing into little channels through the tube into the receiver. The B.P. now states the degree of fineness requisite for several vegetable tinctures, by ordering the powder to be passed through sieves of definite make. A good deal, also, depends upon the way in which the powder is packed into the tube, and experience only will give an idea of the uniform tightness and pressure required to be used. A heavy, round ebony ruler makes a good ram for packing in the powder.

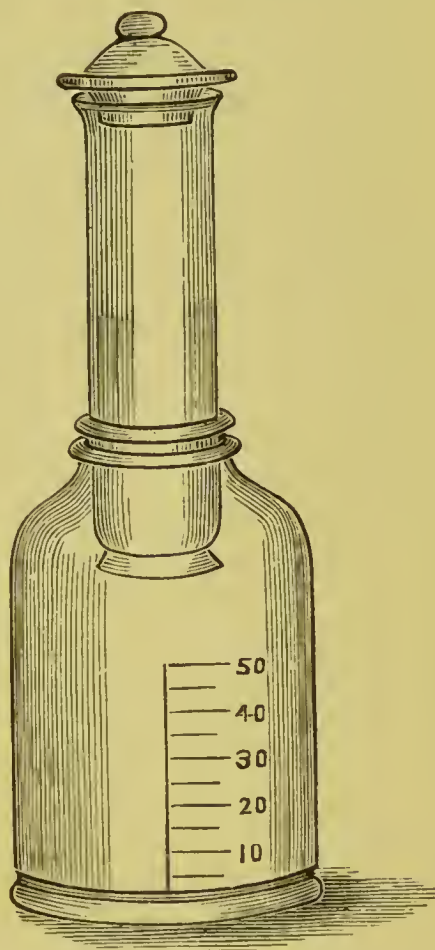


Fig. 21.

Pulverisation is the process of reducing solids to powder. The barks, roots, leaves, stems, and fruits of trees and vegetables are first thoroughly dried, and afterwards ground in a mill, of which there are many kinds. Leaves lose as much as 80 per cent. of their weight by drying and powdering, the powder often gaining greatly in strength over the fresh leaves. Substances are reduced to the coarse powdered state necessary for infusion and percolation just as they are required, by bruising in an iron mortar, operating only on small quantities at once, and then passing the particles through sieves whose meshes are formed of parallel wires arranged with varying degrees of closeness, the powder which passes through being designated according to the number of parallel wires within a linear inch of the sieve surface. Salts and crystals may be reduced to powder in small quantities in a wedgewood mortar, by grinding or trituration, and sifting through muslin or fine metallic netting, the portion not going through the sieve being returned to the mortar, and the operation being repeated till the requisite fineness is obtained. Camphor can

only be powdered by adding about the fourth of its weight of spirit, and triturating it to dryness. Spermaceti, in like manner, by adding a little spirit, may be easily reduced to powder, and tragacanth is best powdered warm. Some substances must be powdered and rubbed with water—"Levigation"—others by granulation, as zinc and tin; and iron, by filing or reducing with hydrogen. The powder differs from the vegetable drug of the same name, by having less water, essential oil, or volatile constituents, less woody fibre, and in being generally more active—powdered opium being one-eighth part at least more active than the fresh drug. The use of the mortar and pestle is fully described under "Mixing" and "Pill Making."

Precipitation in Pharmacy, as in the laboratory, is the process by which we get a substance deposited from a solution, either by adding a second liquid in which it is insoluble, as in pouring water into spirit of camphor, or by mixing two solutions of different salts which combine and form an insoluble compound—as in mixing solutions of perchloride of mercury and iodide of potassium together, the iodide of mercury being thrown down as an insoluble crystalline powder, which is afterwards to be washed by the process of affusion.

Sifting is the process of separating the coarser from the finer particles of pulverised substances, and is generally performed by passing them through the meshes of fine wire, horse-hair, or muslin sieves. When fruits, like prunes, tamarinds, or figs, are ordered to be sifted, the operation is called "Pulping;" here considerable force must be employed to press the finer particles through, which, in the case of dry powders, are allowed to drop through by their own weight.

Solution.—The condition of a substance dissolved in a liquid is a state difficult to define. Most of the instances of solution in Pharmacy are *simple*, as the solution of sugar in syrup, in which case the sugar is found unaltered on evaporation; in others, as in the saccharated solution of lime, the substance is in a state of *chemical* solution, and cannot be recovered unaltered on evaporating. Others again are more difficult still to define, as the solution of one liquid in another, or of a gas in a liquid. The process of solution, with very few exceptions, is quickened by heating the solvent, and having the substance to be dissolved in fine division. Both these advantages are gained by the ordinary method of rubbing the substance in a mortar, with hot water. When the hot solvent ceases to dissolve any more of the substance, the solution is said to be saturated, and, on cooling, will always deposit some of the salt in crystals, the liquid, when cold, being called a cold saturated solution.

Standardization is the name given to the process by which certain preparations, as the extract of nux vomica and cherry-laurel water, are made to contain a definite and uniform amount of the alkaloidal or active principle of the vegetable drug from which they are extracted.

Sublimation is the process by which a solid is reduced by heat to the state of a vapour, which is condensed and deposited on the surface of another vessel, either in masses, when it is called a *sublimate*, like arsenic; or in a feathery pulverulent state called *flowers*, as in the preparation of sulphur. Sometimes this process is improperly called dry distillation.

Testing.—The B.P., to ensure the purity and identity of its different preparations, directs in every convenient case, certain tests; thus the ordinary *qualitative analysis* is employed frequently. Take, for example, the first fluid preparation, "Acetum," which should contain 5.41 per cent. of real acetic acid. The pharmacist is directed to try the effects of sulphuretted hydrogen—if lead be present it is discoloured—but it is necessary to prove also that it contains the requisite percentage of acetic acid by *Quantitative analysis*, and the *Volumetric* method, which estimates the quantity by *measuring* the volume of the reagent necessary to produce the change, and afterwards calculating the weight used; and he is informed that one fluid ounce (445.4 grains) of vinegar is neutralised by 402 grain-measures of the volumetric solution of soda, which is found to correspond to 5.41 per cent. of real acetic acid. In testing the strength of diluted phosphoric acid, a different system—the *Gravimetric*—is directed. A given weight of this acid is poured upon a known weight of oxide of lead, and phosphate of lead is formed. This, after being dried, is weighed—the increase in weight giving the amount of phosphoric anhydride present. Complete volatilisation is the test used for several salts, as those of mercury.

Trituration is the process of reducing solid substances to the state of powder by continued rubbing. Generally, in Pharmacy, the operation is conducted in a wedgewood mortar. (See under "Dispensing of Mixtures" and "Pills." Pages 28 and 46.)

WEIGHTS AND MEASURES

OF THE

BRITISH PHARMACOPŒIA.

WEIGHTS.

1 Grain	gr.		
1 Ounce (Avoir.)	oz.	=	437·5 grains
1 Pound	lb.	= 16 ounces =	7000 „

MEASURES OF CAPACITY.

1 Minim	min.		
1 Fluid Drachm	fl. dr.	=	60 minims
1 Fluid Ounce	fl. oz.	=	8 fluid drachms
1 Pint	O.	=	20 fluid ounces
1 Gallon	C.	=	8 pints

MEASURES OF LENGTH.

1 Inch	in.	
12 Inches	=	1 foot
36 „	=	3 feet = 1 yard

RELATION OF MEASURES TO WEIGHTS.

1 Minim is the measure of		0·9114 grains of water	
1 Fluid Drachm	„	54·6875	„
1 Fluid Ounce	„ 1 ounce or	437·5	„
1 Pint	„ 1·25 pounds or	8750·0	„
1 Gallon	„ 10 pounds or	70,000·0	„

WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

WEIGHTS.

1 Milligramme	= the thousandth part of 1 grm. or	0.001 grm.	
1 Centigramme	= the hundredth	0.01	"
1 Decigramme	= the tenth	0.1	"
1 Gramme	= weight of a cubic centimetre of water at 4° C. (15.432 grs.)	1.0	"
1 Dekagramme	= ten grammes	10.0	"
1 Hectogramme	= one hundred grammes	100.0	"
1 Kilogramme	= one thousand grammes	1000.0	"

MEASURES OF CAPACITY.

1 Millilitre	=	1 cub. centim. or the mea. of 1 gram. of water	
1 Centilitre	=	10	"
1 Decilitre	=	100	"
1 Litre	=	1000	" (1 kilo.)

MEASURES OF LENGTH.

1 Millimetre	= the thousandth part of 1 metre, or	0.001 metre	
1 Centimetre	= the hundredth	0.01	"
1 Decimetre	= the tenth part	0.1	"
1 Metre	- - - - -	1.0	"

RELATION OF THE WEIGHTS OF THE BRITISH PHARMACOPŒIA TO THE METRIC WEIGHTS.

1 Pound	=	453.5927 grammes
1 Ounce	=	28.3495 "
1 Grain	=	0.0648 "

RELATION OF MEASURES OF CAPACITY OF THE BRITISH PHARMACOPŒIA TO THE METRIC MEASURES.

1 Gallon	=	4.543458 litres
1 Pint	=	0.567932 " or 567.932 cubic centimetres
1 Fluid Ounce	=	0.028397 " 28.397. "
1 Fluid Drachm	=	0.003550 " 3.550 "
1 Minim	=	0.000059 " 0.059 "

RELATION OF THE METRIC WEIGHTS TO THE WEIGHTS OF
THE BRITISH PHARMACOPŒIA.

1 Milligramme	=	0.015432	grs.
1 Centigramme	=	0.15432	"
1 Decigramme	=	1.5432	"
1 Gramme	=	15.432	"
1 Kilogramme	=	2 lbs. 3 oz.	
		119.8 grs., or	15432.349 "

RELATION OF THE METRIC MEASURES TO THE MEASURES
OF THE BRITISH PHARMACOPŒIA.

1 Millimetre	=	0.03937	inches
1 Centimetre	=	0.39371	"
1 Decimetre	=	3.93708	"
1 Metre	=	39.37079	" or 1 yard 3.37 inches
* 1 Cubic Centimetre	=		15.432 grains
1 Litre	=	1.76077	pint, or 1 pint 15 oz. 1 dr. 43 m.

* The cubic centimetre is a standard at 4° C. (39° 2 F.), the grain at 62° F (16° 66 C.)

PART II.

THE ADMINISTRATION OF MEDICINES.

PRESCRIPTION READING.

BEFORE studying the details of prescription writing, the student will do well to glance at the following autograph prescriptions, which he may safely take as models of how remedies should be prescribed. The marked tendency of the present day in ordering medicines is to aim at simplicity, and nowhere is the decline of Polypharmacy so evident as in the study of the characteristic recipes reproduced on the following pages.

It is much to be regretted that there is a growing tendency amongst physicians to write carelessly and illegibly, and so universal has this unpardonable habit become, that it is now always made a portion of every pharmaceutical examination to severely test the abilities of candidates in deciphering the illegible prescriptions of physicians, and collections of these unworthy memorials are an indispensable part of the armamentaria of every examiner for a pharmaceutical license. The student should be upon his guard lest he should fall into this habit, and he should endeavour earnestly to write his prescriptions neatly and legibly. Should he be silly enough to imagine that it is an evidence of greatness to write a recipe badly, a glance at the following pages will dispel the delusion.

On each right-hand page will be found the translation of the prescription into unabbreviated Latin, French or German, and English.

44 HERTFORD ST. MAYFAIR. W.

R Nov. 8. 1888.

Lithii Carbon. ℥XXIV

Ammonii Carb. ℥XII.

Tinct. Chiratae 3iv.

— Zingiberis 3℥

℥p. Chloroformi 3iv.

Aqua ad 3viii M.

ft. Mist. Cap. Coch. Ma.

duo bis indies hora

ante cibos.

J. W. G.

Recipe

Lithii Carbonatis, grana viginti quatuor.

Ammonii Carbonatis, grana quadraginta.

Tincturæ Chirætæ, drachmas quatuor.

Tincturæ Zingiberis, semi-drachmam.

Spiritûs Chloroformi, drachmam unam.

Aquæ, ad uncias octo.

Misce.

*Fiat mistura. Capiat cochlearia magna duo bis indies horâ
ante cibos.*

J. Burney Yeo.

Nov. 8, 1888.

Take of

Carbonate of Lithium, twenty-four grains.

Carbonate of Ammonium, forty grains.

Tincture of Chiretta, four drachms.

Tincture of Ginger, half a drachm.

Spirit of Chloroform, one drachm.

Water, to eight ounces.

Mix.

Make a mixture. Take two table-spoonfuls twice in the day
one hour before meals.

J. Burney Yeo.

Nov. 8, 1888.

Hamburg, Oct. 1/88.

R
Ung. Zinci beuz. 10, 0
Amyli oryzae 5, 0
Resorcini puriss. 0, 5
Flg Cl₂ 0, 05

M. f. pasta. S. Die Paste wird
Nachts u. einige Stunden Tags über
in die von Acne befallenen Partien
des Gesichts eingerieben u. jedesmal
vorher mit warmem Wasser u. über-
fetteter Basisseife abgewaschen

R
Resorcini puriss. 10, 0
Spiritus 200, 0
aq. coloniensis. 50, 0
Olei Ricini i, 0

M. S. Mittels des Zerstäubers
Morgens u. Abends den Kopf 1 Minute
zu besprühen zur Beseitigung der
Acne regelmässig begleitenden
Pityriasis capitis.

Dr. P. J. Anna

Recipe

Unguenti Zinci Benzoati, grammata decem.

Amyli Oryzæ, grammata quinque.

Resorcini Purissimi, decigrammata quinque.

Hydrargyri Perchloridi, centigrammata quinque.

Misce.

Fiat pasta. Signa, Die Paste wird Nachts und einige Stunden Tags über in die von Acne befallenen Partieen des Gesichts eingerieben und jedesmal vorher mit warmem Wasser und überfetteter Basisseife abgewaschen.

(In Latin this would be expressed thus :—

Pasta infricanda in partes cutis ab acne affectas, hora somni et, si fieri potest, interdum per diem, partibus prius aqua calida et super-adipato basis-sapone ablutis.)

Recipe

Resorcini Purissimi, grammata decem.

Spiritûs, grammata ducenta.

Aquæ Coloniensis, grammata quinquaginta.

Olei Ricini, gramma unum.

Misce.

Signa, Mittelst des Zerstäubers Morgens und Abends den Kopf eine Minute zu besprühen, zur Beseitigung der die Acne regelmässig begleitenden Pityriasis Capitis.

(In Latin this might be expressed so :—

Solutio aspergenda in caput, per horæ partem sexagesimam, instrumento ad aspergendum facto hora somni et mane ante vestiendum, ut Pityriasis Capitis sanetur, quæ semper acnen concomitatur.)

Dr. P. G. Unna.

Hamburg, October 1st, 1888.

[OVER

Take of

Benzoated Ointment of Zinc, 10 grammes (154·32 grs.).

Rice Starch, 5 grammes (77·16 grains).

Purest Resorcin, 0·5 grammes (7·716 grains).

Perchloride of Mercury, 0·05 grammes (·77 grains).

Mix.

Make a paste.

Mark it, The paste to be rubbed into the parts of the skin attacked by acne, at bedtime, and, if possible, at certain hours of the day, after having each time previously washed these parts with hot water and overfatted Basis soap.

Take of

Purest Resorcin, 10 grammes (154·32 grains).

Rectified Spirit, 200 grammes (7 ounces 45 grains).

Eau de Cologne, 50 grammes (1 ounce 339 grains).

Castor Oil, 1 gramme (15·43 grains).

Mix.

Mark it, This solution to be sprayed at bedtime, and in the morning before dressing, for one minute, upon the scalp with a spray-producer, in order to cure Pityriasis Capitis always accompanying acne.

Dr. P. G. Unna.

Hamburg, October 1st, 1888.

METHODS OF ADMINISTERING MEDICINES.

THERE are various routes by which medicines may find their way into the circulating fluid. The most direct would be

(1) *By injection into the veins*: as ammonia, saline solutions, and milk are injected in desperate emergencies, or as blood may be transfused after excessive hæmorrhages.*

(2) Some authorities recommend the *injection* of the remedy *into an artery*.

(3) By *inhalation*, the vapour of the substance finding its way rapidly into the circulation through the extensive sheet of pulmonary blood vessels, as in the administration of anæsthetics.

(4) By *swallowing*—the commonest and most convenient method—the medicines finding their way through the walls of the gastro-intestinal blood vessels, or lacteals, into the current.

(5) By absorption from the *rectum*; in this way the great majority of substances (in the form of enemata or suppositories) may find their way into the blood.

(6) By absorption from the *vaginal* surface in the female, when given in the form of pessary.

(7) By absorption from the *bladder*. Some experimentalists have influenced the system by narcotic remedies injected into the vesical cavity.

(8) By absorption from the *peritoneal* cavity, as has been recently proposed in cases of severe hæmorrhages by injecting saline solutions and milk, &c., into the sac of the peritoneum.

(9) By absorption from the *deep tissues*, as strychnine is often injected into the centre of a large muscle, by the method known as "*parenchymatous injection*."

(10) By the *hypodermic method*; a solution or mixture containing the substance being injected by a fine syringe into the *subcutaneous areolar tissue*, from which it is rapidly absorbed

* The ordinary aspirator (Diculafoy's) can be safely used for this purpose if the two rubber tubes are made exactly alike, and are each rendered capable of bearing one of the large needles at one end, whilst the other end is connected with the cylinder of the machine. In this way a thoroughly reliable transfusion apparatus can be always at hand. (See the Author's Dictionary of Treatment, page 37.)

by the small blood vessels and lymphatics. In this way morphine is best given to relieve severe pain, and ether to counteract the shock of formidable hæmorrhages.

(II) By the skin. Through the cutaneous tissue medicines may be administered with the view of affecting the system, by four methods :—

1. *The Enepidemic.* 2. *The Epidemic or Iatroleptic.*
3. *The Endermic.* 4. *By Inoculation.*

AB
In the Enepidemic method friction is not employed; the medicine to be so administered is simply placed in contact with the skin. Though this is, at the best, a slow and uncertain way to introduce a remedy into the circulation, the results of experiments show that the alkaloids dissolved in chloroform, when placed in contact with the unbroken skin, are readily absorbed, and soon find their way into the blood. Waller has shown that this endosmotic quality of chloroform enables it to penetrate the skin of the cadaver and to carry the alkaloids with it. Watery or alcoholic solutions either do not enter the blood at all when administered in this way, or are absorbed in such small quantities that they may be regarded as inert.

By the Epidemic method the medicine is also introduced into the system through the unbroken cuticle, but friction is employed. In this way we administer cod-liver oil in wasting diseases, and mercurial ointment in syphilis.

By the Endermic method the difficulty of absorption through the cuticle is obviated by its removal. This is accomplished by soaking a piece of porous fabric in strong solution of ammonia, applying it to the surface of the skin, and instantly covering it over with a piece of oiled silk, or a watch-glass, when speedy vesication ensues. The remedy, in the state of fine powder, should be dusted over the denuded spot, when its rapid absorption will occur. In this way morphine, strychnine, or atropine can be administered. The same result follows if the remedy be applied over a portion of skin whose cuticle has been removed by an ordinary blister.

By the operation of Inoculation (as for small-pox) remedies may be introduced into the system through the punctured cuticle.

These different methods or routes by which medicines find their way into the system should not be confounded by the student with the various local methods of applying remedies. Thus, sternutatories are applied to the nasal mucous membrane, and substances, by the method of insufflation, are brought in contact with the posterior nares and surrounding parts; or the nasal douche may be employed with the same intention.

Sialagogues are used to act on the salivary glands through stimulation of the nerves distributed to the mucous membrane of the mouth.

The fauces and tonsils are reached by gargles, and the larynx by atomised spray ; while the bronchial mucous surface may be exposed to the local action of various inhalations, or to the fumes of volatile substances in a state of combustion.

In the same way, most of the cavities of the body, all tortuous wounds, and open sores, may be reached by injections, lotions, bougies, pessaries, suppositories, &c.

DOSAGE OR POSOLOGY.

Before the student considers the question of prescription writing, it will be necessary to say a few words about the doses of medicines. As the alphabetical arrangement of this work will enable him to find at a glance the dose of every drug in the *Materia Medica* ; and in a similar way the dose of all the various Galenical preparations are tabulated ; it will thus be unnecessary here to have any repetition in the form of tables or lists of doses.

Though the official doses may be regarded as safe guides, still the student must remember that there are many conditions which modify very considerably the effect of remedies, and should materially affect their dosage.

The most important of these modifying agents are :—

Q

Age, Idiosyncrasy, Habit, Interval between the Doses, Disease, Climate, Race and Temperament, Sex, Body Weight, Method and Form in which the Medicine is Administered, Temperature, Hour of the Day, Mental Emotion, Fasting, Cumulative Action, &c.

Age—This is the most important factor in determining the amount of the dose, and is the one which gives most trouble to the student. In the *Materia Medica* portion of this book, the dose for a child one year old is given under the heads of the most frequently employed infantile remedies. It should be remembered that children bear opiates very badly, and their use, consequently, is unsafe for children under one year old, even in most minute doses.

This intolerance of opium, it may be, has led to very erroneous ideas about the amount of the dose of other remedies for children.

Children will often bear nearly as full doses as adults, of various remedies, as may be seen in the case of arsenic, calomel, squill, belladonna, ipecacuanha, and many purgatives, like rhubarb, jalap, &c.

Gaubius took the average adult dose of a remedy as 1, say 1 grain, and calculated the requisite amount for the different ages thus :—

For a child 1 year old, $\frac{1}{12}$ gr. ; 2 years old, $\frac{1}{8}$ gr. ; 3 years old, $\frac{1}{6}$ gr. ; 4 years old, $\frac{1}{4}$ gr. ; 7 years old, $\frac{1}{3}$ gr. ; 14 years old, $\frac{1}{2}$ gr. ; 20 years old, $\frac{2}{3}$ gr. ; and for ages between 21 and 60 years, 1 gr.

Young's rule is—"That for children under 12 years the doses of most medicines must be diminished in the proportion of the age to the age increased by 12."

If the student wishes to find out the dose for a given age by this method, he has simply to add 12 to the age in years, and divide the age by the amount thus obtained, the answer giving a fraction, which is the required amount of the full adult dose. Thus, suppose the adult dose to be 1 grain, the dose will be :—

$$\text{For a child 1 year old} \quad \dots \quad \frac{1}{1+12} = \frac{1}{13} \text{ grain.}$$

$$\text{For a child 2 years old} \quad \dots \quad \frac{2}{2+12} = \frac{1}{7} \text{ grain.}$$

$$\text{For a child 3 years old} \quad \dots \quad \frac{3}{3+12} = \frac{1}{5} \text{ grain.}$$

$$\text{For a child 8 years old} \quad \dots \quad \frac{8}{8+12} = \frac{2}{5} \text{ grain.}$$

$$\text{For a child 12 years old} \quad \dots \quad \frac{12}{12+12} = \frac{1}{2} \text{ grain.}$$

Cowling's rule is to divide the number representing the age of the patient upon his next birthday by 24. Thus a child $5\frac{1}{2}$ years old would receive $\frac{6}{24}$ or $\frac{1}{4}$ of the full adult dose of ordinary remedies.

Brunton, in order to make Cowling's rule adapt itself to the metric system, proposes to use the number 25 instead of 24, and to multiply both the numerator and denominator of the fraction by 4. Thus, for a child 3 years, the dose would be ascertained in this way—

$$\frac{4}{25} = \frac{16}{100} = .160$$

Suppose the adult dose to be 1 gramme, the child of 3 years would receive .160 gramme, or 16 centigrammes.

(2) *Idiosyncrasy*—The physician meets with individuals in whom an ordinary dose of some well-known drug causes symptoms more intense, or entirely different from those usually observed to follow its administration, and when these cannot be accounted for by any known law, the case is generally regarded as one of idiosyncrasy.

Patients are occasionally met with in whom the smallest dose of calomel will be followed by profuse salivation; whilst enormous doses of opium and chloroform are sometimes borne by those unaccustomed to their use. Iodide of potassium is the best example of a drug whose action is occasionally modified by some idiosyncrasy in the patient.

Habit determines the dose of some medicines more than any other influence; this is particularly true of narcotics. Many instances are recorded of opium eaters who took a pint of laudanum daily without experiencing the soporific effects of the drug, and the arsenic eaters of Styria are examples of the same.

The interval between the doses should determine to a large extent the amount of the dose; this is too frequently overlooked in tables. No rule can, however, be laid down on the subject, but the student should be guided by the nature of the action of the medicine, the effects required to be produced by it, and the rate of its absorption, &c.

Disease modifies considerably the dose of a medicine; instances of this may be seen in the large quantities of opium needed in desperate inflammations and intensely painful conditions of various nerves. Mercury and opium are badly borne in albuminuria, whilst in syphilis large quantities of mercury can be freely given. MB.

Climate and Temperament possess varying effects upon the amount of medicine required to produce its results in a healthy individual.

The Temperature of the patient, and of the surrounding atmosphere has a very decided effect upon the dose of many medicines. Brunton has found that substances like veratrine, strychnine, &c., act in entirely different ways according as the temperature is high or low, this possibly being to some extent the explanation of the indication for the administration of stimulants in the early morning in severe fevers.

Fasting—The rapidity with which medicines are absorbed and affect the system in this condition are well recognised.

The method by which the medicine is administered affects the dose: thus, as a rule, the dose of remedies given by the rectum requires to be twice as great as if given by the mouth. Strychnine is an exception, being more active when given by the bowel than if swallowed. The dose may be said to be about a half, or two-thirds, of the ordinary quantity when administered by the hypodermic method. MB.

The form in which the medicine is administered may affect its action, thus the active principles of drugs when isolated and given in a soluble form will act with greater rapidity and intensity than the corresponding amount of the crude drug, and some

conditions of the medicine itself (chiefly those which relate to its rate of absorption or elimination) affect materially the amount of the dose.

11 *Sex and Body Weight* materially affect the action and dose of some drugs; as a rule, women require smaller doses, and the dose should be less for a man weighing 100 lbs. than for one double this weight.

12 *Accumulation or Cumulative Action* modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium have been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with; the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importance that the physician should avoid ordering remedies which, when mixed, destroy each other's virtues. Incompatibility is generally said to be threefold:—

1. *Chemical.* 2. *Therapeutical.* 3. *Pharmaceutical or Absolute.*

Of the first may be instanced syrup of squill and salvolatile; acetate of lead and sulphuric acid or sulphate of zinc; iron and the numerous substances containing tannic acid.

As an example of the second form of incompatibility may be mentioned a mixture, or pill, containing strychnine and Calabar bean.

Substances are said to be *absolutely* incompatible when they cannot be mixed together by the pharmacist, as borax and mucilage, or tincture of tolu, myrrh, or benzoin, when ordered with water. (See page 35.)

Experience proves that many compounds, regarded formerly as incompatible, are valuable combinations. It does not follow if a mixture be *inelegant* that it is worthless, though some consider such should be regarded as incompatible and never employed. The official Mist. Ferri Co. and Mist. Ferri Aromat. may be cited as popular preparations, though instances of incompatibles. Antipyrine should not be prescribed with spirit of nitre, iodine, Prussic Acid, and ferric salts.

Unfortunately no rule can be laid down to prevent the student ordering substances which oppose each other in their action in the system, or which chemically decompose each other, or

which will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of chemistry and pharmacology will generally prevent such a mistake.

Amongst the various general rules of incompatibility there is one which the student should remember—*that a drug should never be ordered in combination with any of its tests or antidotes.*

The substances in the following short list can be combined with so few preparations that the student will be wise to order them alone in simple solution :—

Permanganate of Potassium, Tannic and Gallic Acids, Corrosive Sublimate, Iodide of Potassium, Salts of Lead, Salts of Zinc, Iodine and its liquid preparations, Nitrate of Silver, Tincture of Guaiacum, Citrate of Iron and Quinine, Free Chlorine in solution.

The student should turn to the short article on page 65 dealing with incompatibility in dispensing.

The following excellent summary of incompatibilities is from "The Art of Dispensing" :—

LIST OF INCOMPATIBILITIES.

Acid arsenious, with lime-water, oxide of iron, magnesia.

Acids generally, with alkalis, acetates, metallic oxides.

Albumen, with acids, spirit, tannin, corrosive sublimate.

Alkaloidal salts generally, with tannin, alkaline and earthy carbonates, iodine and its compounds, liquorice, strong mucilages, alkaline and ammoniated tinctures.

Alum sulphate, with alkalis and alkaline carbonates.

Ammonium bromide, with mineral acids, alkaline carbonates, chlorine, chlorate and bichromate of potash, nitrate of silver, calomel.

Apomorphine (hydrochlorate), with carbonate and bicarbonate of soda, salts of iron, iodine, and tannin.

Barium chloride, with sulphuric and phosphoric acids and their salts, tartrates and carbonates, medicinal wines and vegetable infusions.

Bicarbonate of soda, with acids, tannin, salts of the metals and of the alkaloids.

Bismuth subnitrate, with tannin, sulphur, sulphide of antimony, calomel.

Chloral hydrate, with water (slow decomposition), warm water, alkaline carbonates, vegetable alkalis, ammonia salts, nitrate of mercury, calomel.

Chlorate of potash, with mineral acids, organic substances, sulphur, carbon, calomel, iodide of iron, &c.

conditions of the medicine itself (chiefly those which relate to its rate of absorption or elimination) affect materially the amount of the dose.

11 *Sex and Body Weight* materially affect the action and dose of some drugs; as a rule, women require smaller doses, and the dose should be less for a man weighing 100 lbs. than for one double this weight.

12 *Accumulation or Cumulative Action* modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium have been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with; the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importance that the physician should avoid ordering remedies which, when mixed, destroy each other's virtues. Incompatibility is generally said to be threefold:—

1. *Chemical.* 2. *Therapeutical.* 3. *Pharmaceutical or Absolute.*

Of the first may be instanced syrup of squill and salvolatile; acetate of lead and sulphuric acid or sulphate of zinc; iron and the numerous substances containing tannic acid.

As an example of the second form of incompatibility may be mentioned a mixture, or pill, containing strychnine and Calabar bean.

Substances are said to be *absolutely* incompatible when they cannot be mixed together by the pharmacist, as borax and mucilage, or tincture of tolu, myrrh, or benzoin, when ordered with water. (See page 35.)

Experience proves that many compounds, regarded formerly as incompatible, are valuable combinations. It does not follow if a mixture be *inelegant* that it is worthless, though some consider such should be regarded as incompatible and never employed. The official Mist. Ferri Co. and Mist. Ferri Aromat. may be cited as popular preparations, though instances of incompatibles. Antipyrine should not be prescribed with spirit of nitre, iodine, Prussic Acid, and ferric salts.

Unfortunately no rule can be laid down to prevent the student ordering substances which oppose each other in their action in the system, or which chemically decompose each other, or

which will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of chemistry and pharmacology will generally prevent such a mistake.

Amongst the various general rules of incompatibility there is one which the student should remember—that a drug should never be ordered in combination with any of its tests or antidotes.

The substances in the following short list can be combined with so few preparations that the student will be wise to order them alone in simple solution :—

Permanganate of Potassium, Tannic and Gallic Acids, Corrosive Sublimate, Iodide of Potassium, Salts of Lead, Salts of Zinc, Iodine and its liquid preparations, Nitrate of Silver, Tincture of Guaiacum, Citrate of Iron and Quinine, Free Chlorine in solution.

The student should turn to the short article on page 65 dealing with incompatibility in dispensing.

The following excellent summary of incompatibilities is from "The Art of Dispensing" :—

LIST OF INCOMPATIBILITIES.

Acid arsenious, with lime-water, oxide of iron, magnesia.

Acids generally, with alkalis, acetates, metallic oxides.

Albumen, with acids, spirit, tannin, corrosive sublimate.

Alkaloidal salts generally, with tannin, alkaline and earthy carbonates, iodine and its compounds, liquorice, strong mucilages, alkaline and ammoniated tinctures.

Alum sulphate, with alkalis and alkaline carbonates.

Ammonium bromide, with mineral acids, alkaline carbonates, chlorine, chlorate and bichromate of potash, nitrate of silver, calomel.

Apomorphine (hydrochlorate), with carbonate and bicarbonate of soda, salts of iron, iodine, and tannin.

Barium chloride, with sulphuric and phosphoric acids and their salts, tartrates and carbonates, medicinal wines and vegetable infusions.

Bicarbonate of soda, with acids, tannin, salts of the metals and of the alkaloids.

Bismuth subnitrate, with tannin, sulphur, sulphide of antimony, calomel.

Chloral hydrate, with water (slow decomposition), warm water, alkaline carbonates, vegetable alkalis, ammonia salts, nitrate of mercury, calomel.

Chlorate of potash, with mineral acids, organic substances, sulphur, carbon, calomel, iodide of iron, &c.

Chlorine (chlorine-water), with alkalies, alkaline carbonates, salts of ammonia, vegetable salts, nitrate of silver, lead salts, tannin, vegetable mucilages, extracts, waters, infusions, tinctures and syrups, milk, and emulsions.

Corrosive sublimate, with carbonates, lime-water, iodide of potassium, opium, vegetable infusions, tannin, but compatible with the carbonates of lime, baryta, and strontia, either in powder or super-carbonated solution.

Digitalis, with tannin, sugar of lead, iodine, iodide of potassium, alkaline carbonates.

Golden sulphuret of antimony, with bicarbonate of soda, cream of tartar, calomel, subnitrate of bismuth.

Gum arabic, with perchloride of iron, lead salts, spirit, ethereal tinctures, borax.

Iodine, with ammonia, starch, metallic salts, fatty or essential oils, emulsions, chloral, earthy carbonates, gum arabic, tragacanth, salep.

Iron powdered (iron reduced by hydrogen), with aloes, vegetable infusions and extracts, tannin, metallic and alkaloidal salts.

Iron salts, with alkaline carbonates, vegetable infusions and extracts, tannin, mucilage.

Lime-water, with acids, carbonates, ammonia salts, metallic salts, tartrates, infusions, tinctures, tannin.

Morphine and its salts, with oxide of iron, salts of iron, manganese, and silver.

Musk, with acids, acetates, tannin, ergot of rye, metallic salts.

Nitrate of silver, with hydrochloric, sulphuric, acetic, and tartaric acids and their salts, hydrocyanic acid and its compounds, iodine, iodide and bromide of potassium, alkaline and earthy carbonates, sulphur, and sulphide of antimony.

Nitrite of amyl, with tinctures, alkaline carbonates, calomel, lead salts, proto-salts of iron, iodide of potassium.

Opium, with alkaline carbonates, salts of the metals, tannin, iodine, chlorine-water, and nux vomica. Although opium and belladonna are supposed to be physiologically incompatible, they are often administered together with good results.

Pepsin, with alcohol, tinctures.

Permanganate of potash, with organic substances.

Salicylic acid and salicylate of soda, with iron salts, iodide of potassium, lime-water.

Strophanthus (tincture) in water undergoes hydrolysis, with formation of a toxic substance.

Tannin, with mucilage, all metallic salts, lime-water, alkaline carbonates and bicarbonates, egg albumen, gelatine.

Tartar emetic, with acids, alkalies, soap, calomel, tannin, rhubarb, cinchona, gum arabic, opium.

The various prescriptions scattered throughout the portion of this work devoted to Therapeutics will materially assist the student in selecting elegant and useful forms in which to administer the most important remedies. Some, indeed, of these may be open to the objection of containing incompatible substances, as iodide of potassium and corrosive sublimate; but where a combination has been proved by experience to be valuable, its inelegance or supposed incompatibility has been occasionally overlooked.

THE COMBINATION OF MEDICINES.

The compounds of the last generation, containing numerous absurd and incompatible ingredients, have, it is to be feared, forced many into the opposite extreme of simplicity. In this way combinations of remedies of the utmost value have fallen into disuse.

Paris pointed out the great advantages to be derived from a judicious combination of medicines: thus he found that the action of a medicine may be increased by combining several different preparations of it. Suppose, for example, we wish to get *all* the virtues of cinchona, we obtain them best from a mixture like the following:—

R *Ext. Cinchonæ Liq.* ℥ij.
 Tinct. Cinchonæ ℥j.
 Decoct. Cinchonæ ℥iv.
 Infus. Cinchonæ ℥x. *misce.*

Fordyce showed that a much more valuable and reliable remedy may be obtained by combining various substances whose actions resemble, or are identical with, each other. Thus, the best diuretic would be a mixture of digitalis, squill, broom, and bicarbonate of potassium, infinitely superior to a proportionate dose of any one of them when administered singly.

The action of some medicines is increased by combining with them substances, the previously known qualities of which would have given no clue to their usefulness in this respect; thus, the diuretic power of digitalis and squill is intensified by mercury.

By the judicious combination of two or more remedies we are often enabled to correct undesirable qualities possessed by one of them; thus alkalies correct the griping of aloes, and hyoscyamus that of colocynth; arsenic prevents the acne which follows the administration of bromide of potassium; and

atropine corrects the unpleasant symptoms caused by a hypodermic dose of morphine.

By a regulation of the dose of various remedies of the same class, though differing in their methods of action, occasionally, a better compound may be obtained, as pointed out by Paris; thus by giving a cholagogue with a saline, more effectual purgation is obtained; or by combining bromide of potassium with a narcotic, a more prolonged hypnotic action may be obtained.

WEIGHTS, MEASURES, AND SYMBOLS USED IN PRESCRIBING.*

The weights used in prescribing and dispensing are of the official system, which starts with the Troy grain and ends with the Avoirdupois pound.

MB. {

1 Grain, <i>gr.</i>	=	1 grain.
1 Ounce, <i>oz.</i>	=	437.5 grs.
1 Pound, <i>lb.</i>	=	7,000 grs.

The official Measures of Capacity which are generally met with in prescriptions are :—

1 Minim, <i>min.</i>	= 1 minim	=	91 grs. of water.
1 Fluid Drachm, <i>fl. dr.</i>	= 60 minims	=	54.68 „ „
1 Fluid Ounce, <i>fl. oz.</i>	= 8 fluid drs.	=	437.5 „ „

It will thus be noticed that there is no *official* weight between 1 grain and 1 ounce; but the ʒi. and ʒi. , which represented the $\frac{1}{8}$ and $\frac{1}{24}$ part of the old Troy ounce, are still permitted to exist under protest. They are, when used in a prescription, to be taken as meaning 60 grs. and 20 grs. respectively, and not the $\frac{1}{8}$ and $\frac{1}{24}$ of the Avoirdupois ounce, which would be 54.68 and 18.22 grains respectively.

The French Gramme, = 15.432 grs.

The following are the symbols and signs met with in prescription writing; they must not be confounded with the *official* symbols, which are simply the first two letters of the English words, as *fl. oz.*, *fl. drm.*, &c.

Gr. = Granum, 1 grain = $\frac{1}{480}$ of a Troy ounce, or $\frac{1}{37}$ of an Avoirdupois ounce.

* Upon pages 78, 79 and 80, will be found a full table of the Weights and Measures of the British Pharmacopœia.

- ℥. = Scrupulum, 1 scruple = 20 grains.
 ʒ. = Drachma, 1 drachm = 60 grs. or 3 scruples or $\frac{1}{8}$ of a fluid ounce, or 60 minims.
 ʒ̄. = Uncia, 1 ounce = 1 Troy oz. (480 grs.) or 1 fluid oz. (480 minims), or 437.5 grains of water.
 M. = Minimum, 1 minim = $\frac{1}{60}$ part of a fluid drachm or the volume of .9115 grains of water.
 Gtt. = Gutta, 1 drop, erroneously supposed to represent 1 minim.
 O. = Octarius, 1 pint, = 20 fluid ounces, or $1\frac{1}{4}$ lbs. of water.
 C. = Congius, 1 gallon, = 8 pints, or 10 lbs. of water.

DOMESTIC MEASURES.

- A tea-spoonful—Cochleare minimum = 1 fluid drachm (ʒj.)
 A dessert-spoonful—Cochleare medium = 2 fluid drs. (ʒij.)
 A table-spoonful { Cochleare amplum, or } = 4 fluid drs. or $\frac{1}{2}$ oz.
 { Cochleare magnum } = (ʒiv.) or ʒss.
 A wine-glassful—Cyathus vinarius = $2\frac{1}{2}$ fluid oz. (ʒiiss.)

The practice of measuring medicines in spoons is open to very serious objections, since seldom will two be found just alike in capacity, and the physician should make a rule of examining the spoon and ascertaining its dimensions before the patient uses it as a measure. The common "kitchen" spoon, which is generally made of iron and coated over with tin, fluctuates less in size than the other domestic measures; it can be relied upon as holding two fluid drachms. The wine-glass is generally stated to contain $1\frac{1}{2}$ to 2 oz. It will, however, be nearly always found to contain at least $2\frac{1}{2}$ oz., or the eighth part of an Imperial pint. The writer believes that most physicians when ordering medicine to be taken in doses of a wine-glassful, calculate upon the wine-glass containing at most 2 oz. This idea arises from the old wine-glassful being equal to the $\frac{1}{8}$ part of the old wine pint of 16 oz.

A small tea-cup contains on an average about 7 fluid ounces, and a breakfast-cup about 12 fluid ounces. These figures are much above those mentioned in most books.

An ordinary tumbler holds generally half-a-pint. In all cases where the physician prescribes an *active* medicine he should order the dose to be measured in a graduated glass.

The mistake of counting drops as minims has been already referred to in the Pharmacy Section (p. 24).

PRESCRIPTION WRITING.

In one sense, this may be said to be the highest accomplishment of the educated physician, since it requires for its correct performance an intimate knowledge of all the medical sciences, and a practical acquaintance with the art of Pharmacy. It is to be regretted that a more intimate knowledge of this latter art is not cultivated by the student of medicine. There could scarcely be a more erroneous idea than that which one occasionally meets with—*i.e.*, that Pharmacy is beneath the notice of the physician.

The writer believes there are very few things which give so great advantages in after life to the physician as an intimate acquaintance with this art.

The Model Prescription should consist of the following parts:—

1. *The Superscription.* 2. *The Inscription.* 3. *The Subscription.* 4. *The Signature.*

1. The *Superscription*, which consists of the letter \mathcal{R} , originally was used, it is supposed, to represent the symbol of the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star. By common consent, it is now regarded as representing the imperative mood of the Latin verb *Recipio*, to take; and the French accordingly commence their prescriptions with *P.*, or *Prenez*.

2. The *Inscription* may be called the *body* of the prescription; it includes the names of the substances to be administered, with their quantities, written in Latin, and as it is the most important part of the prescription, it will be referred to presently at more length.

3. The *Subscription* is made up of the directions (in Latin) for the guidance of the dispenser; thus *misce*, often written *m.*, is frequently the only part in a prescription which belongs to the subscription.

4. The *Signature* includes the directions or instructions intended for the benefit of the patient. They are frequently written by the prescriber in English, and many recommend that Latin should never be used for this part of the prescription.


Mistakes are certainly more liable to occur if the signature be written carelessly, or if incorrect Latin be employed, but the same reasons which have determined the use of this language for prescriptions from an early time, apply equally well to the signature. Thus, a prescription written in Latin can be read and understood in every civilised country. Abbreviations and contractions can be employed without fear of being misunder-

stood, which could not be the case if any other language were substituted ; we are thus often able, by a single letter, to express the meaning of several English words.

It is often absolutely *necessary* to write the inscription in such a way that the patient may remain innocent of the nature of its contents.

The use of long and elaborate Latin phraseology is to be condemned in prescribing, and the student, when he feels any difficulty in expressing himself in this tongue, had certainly better fall back upon his English when writing the signature. This he can do by using the Latin word *Signa*, after which the signature may be written in unabbreviated English.

The patient's name is written at the top or bottom of the recipe, preferably the top, as it is thus less liable to be overlooked or mistaken than if written where space is often limited. The prescriber's initials generally follow at the right hand corner, and the date is written opposite.

 The student should not confound the *initials* of the prescriber with that portion of the prescription called the signature—*i.e.*, the directions to the patient.

It is hardly necessary to remind the student of the necessity of writing clearly and legibly, and of avoiding the use of such contractions as might lead to mistakes.

The *body* or inscription of a model prescription should contain the following :—

The *Basis*, or principal active ingredient.

The *Adjuvant*, or *Auxiliary*, to assist its action.

The *Corrective*, to correct or diminish some undesirable quality.

The *Vehicle*, or *Excipient*, to give a suitable form for administration.

The following prescription may be regarded as a very commonly ordered combination of remedies :—

R SUPERScription.

(Basis.) *Pot. Acet.* ℥v.

(Adjuvant.) *Tinct. Digitalis* ℥j.

(Corrective.) *Syr. Aurantii* ℥j.

(Vehicle.) *Dec. Scopar. ad* ℥viiij.

} INSCRIPTION.

Misce, fiat mist. SUBSCRIPTION.

Cpt. Cochl. mag. ii. 4ta. q. q. hora ex paul. aquæ. . SIGNATURE.

Without abbreviations or contractions it would read thus :—
Recipe.

Potassii Acetatis drachmas quinque.

Tincturæ Digitalis drachmam unam.

Syrupi Aurantii unciam unam.

Decoctum Scoparii ad uncias octo.

Misce, fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ ex paululo aquæ.

The student will find benefit from a careful study of the following pages, in which the Latin of the above prescription is arranged according to the English idiom, and each word parsed and translated :—

Latin Idiom :

Recipe Potassii Acetatis drachmas quinque.

R (Recipe)	...	{ v. irr. tr. im. m. 2nd per. s., to agree with its nom. <i>Tu</i> —"thou" (understood). Rule i., recipi-o, recep-i, receptum, recipere. }	Take thou
v (quinque)	...	{ num. adj. indec. ac. pl. qual. and agreeing with drachmas. Rule ii. }	five
3 (drachmas)	...	{ n. f. ac. pl. Rule viii. (a) drachma—æ. }	drachms
Acet. (acetatis)	...	{ n. f. gen. s. qual. drachmas. Rule vi. (a), acetate—atis. }	of acetate
Pot. (potassii)	...	{ n. n. gen. s. qual. acetatis. Rule vi. (a), potassium—ii. }	of potassium.

Latin Idiom :

Recipe Digitalis Tincturæ drachmam unam.

R (Recipe)	...	(understood)	Take thou
j (unam)	...	{ num. adj. ac. s. qual. and agreeing with drachmam. Rule ii., unus—a—um. }	one
3 (drachmam)	...	{ n. f. ac. s. gov. by recipe. Rule viii. (a), drachma—æ. }	drachm
Tinct. (tincturæ)	...	{ n. f. gen. s. qual. drachmam. Rule vi. (a), tinctura—æ. }	of the tincture
Digit. (digitalis)	...	{ n. f. gen. s. qual. tincturæ. Rule vi. (a), digitalis—is. }	of digitalis.

Latin Idiom :

Recipe Aurantii Syrupi unciam unam.


R (Recipe)	...	(understood)	Take thou
j (unam)	...	(parsed as before)	one

$\bar{3}$ (unciam)	... { n. f. ac. s. gov. by recipe. Rule viii.(a), uncia—æ. }	ounce
<i>Syr.</i> (syrupi)	... { n. m. gen. s. qual. unciam. Rule vi.(a), syrupus—i. }	of syrup
<i>Aur.</i> (aurantii)	... { n. neu. gen. s. qual. syrupi. Rule vi.(a), aurantium—ii. }	of orange peel.

Latin Idiom :

Recipe Decoctum Scoparii ad uncias octo.

R (Recipe)	... (understood)	Take thou
<i>Decoct.*</i> (decoctum)	{ n. neu. s. acc. gov. by recipe. Rule viii.(a), decoctum—i. }	decoction
<i>Scop.</i> (scoparii)	{ n. masc. gen. s. qual. decoctum. Rule vi. (a), scoparius—ii. }	of broom
<i>Ad</i>	... prep.gov.uncias. Rule-viii.(b)	up to
viiij (octo)	{ num. adj. indec. qual. uncias. Rule ii. }	eight
$\bar{3}$ (uncias)	{ n. f. ac. pl. gov. by ad. Rule viii.(b), uncia—æ. }	ounces.

 N.B.—The student must have a clear idea of the meaning of this Ad. It means that the dispenser, after measuring the other ingredients, must add enough of the decoction to make the entire quantity measure 8 oz.

Latin Idiom :


Misce, fiat mistura.

<i>M.</i> (misce)	... { v. trans. imp. m. p. t. agreeing with and gov. by (tu) understood. Rule i. misceo —ui, mixtum or mistum miscere. }	Mix you, or mix,
<i>Mis.</i> (mistura)	... { n. f. nom. s. governing fiat. Rule i., mistura—æ. }	let a mixture
<i>Ft.</i> (fiat)	... { v. used as passive of facio, pres. sub. 3rd s. used as imp. gov. by and agreeing with mistura; fio, factus sum, fieri; to be made or become. }	be made

Latin Idiom :

Capiat cochlearia magna duo quarta quâque horâ ex aquæ paululo.

<i>Cpt.</i> (capiat)	... { irr. v. tr. sub. m. pr. t. 3rd per. s. agreeing with and gov. by (is) understood. Rule i., capio, cepi, captum, capere, the present, subjunctive used as an imperative. Rule x.(a). }	He may take, or let him take,
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 * Some authorities would put Decoct. in the genitive—a partitive genitive—i.e., “of decoction.” In the same way, where the student meets *Aquam ad $\bar{3}$* —, in the different prescriptions throughout the Fourth Part of this work, he may substitute *Aquæ ad $\bar{3}$* . Either form is correct.

<i>ij</i> (duo)	...	{ num. adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., duo—æ—o. }	two
<i>Mag.</i> (magna)	...	{ adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., magnus—a—um. }	large
<i>Coch.</i> (cochlearia)		{ n. ac. pl. neut. gov. by capiat. Rule viii.(a), cochleare—is. }	spoonfuls
<i>q.q.</i> (quâque)	...	{ pron. indef. abl. s. qualifying and agreeing with hora. Rule ii., quisque, quæque, quodque. }	at each
<i>4ta</i> (quarta)	...	{ num. adj. abl. s. qualifying and agreeing with hora. Rule ii., quartus—a—um. }	fourth
<i>Hora</i>	...	{ n. f. abl. s. Rule ix.(a), hora —æ. }	hour
<i>Ex</i>	...	prep. Rule ix.(c).	out of (in)
<i>Paul.</i> (Paululo)	...	{ adj. abl. s. used as a noun, gov. by ex, paululus—a —um. }	a little
<i>Aq.</i> (Aquæ)	...	{ n. f. gen. s. qual. paululo. Rule vi., aqua—æ. }	of water.

GRAMMATICAL AIDS TO PRESCRIPTION WRITING

Two languages differ in *words*, *inflections*, and *idioms*.

"A student who wishes to read the Latin language must thoroughly understand the *meaning* of its words, the *force* of its inflections, and the *nature* of its idioms."

As far as the *words* are concerned, a limited knowledge of the language, and one sufficient for the intelligent reading and writing of physicians' prescriptions, may be obtained from the following brief vocabulary.

The *inflections* may be learned from any Latin grammar whilst the student may obtain a fair conception of the *idioms* or order of words from a careful study of the few important rules of Syntax which follow.

A FEW RULES OF LATIN SYNTAX, APPLICABLE TO THE CONSTRUCTION OF PHYSICIANS' PRESCRIPTIONS.

Syntax is generally divided into two parts—CONCORD and GOVERNMENT.

Concord is the agreement between two Latin words, one influencing the other. There are three concords:—

1. A Verb, with its subject (as Rule I.)
2. Adjectives, with the nouns which they qualify. (Rule II.)
3. The Relative, with its antecedent. (Rule III.)

RULE I.

A personal verb agrees with its subject or nominative, in number and person ; as, *Ego tero*—I rub ; *Tu sumas*—You may take ; *Id fiat*—It may be done.

In prescription writing, the *active* voice of verbs is generally only used in the 2nd person singular of the imperative mood, and 3rd person singular or plural of the present subjunctive.

The use of the *passive* voice is generally confined to the 3rd person singular or plural of the present subjunctive, and the different parts of the Gerundive.

RULE II.

Adjectives, participles, and pronouns, whether belonging to the subject or the predicate, agree in gender, number, and case with the noun or the pronoun to which they refer ; as *Pulvis unus*—One powder ; *Uncia una*—One ounce ; *Sevum Præparatum*—Prepared suet.

RULE III.

The relative must agree with its antecedent in gender, number, and person ; as, *Syrupus qui optimus est*—The syrup which is best ; *Mistura quæ bona est*—The mixture which is best ; *Medicamentum quod neglectum est*—The medicine which has been neglected.

RULE IV.

If a verb has more than one subject the verb must be put in the plural number ; as *Pilula et mistura capiantur*—The pill and mixture are to be taken.

RULE V.

A participle governs the same case as the verb to which it belongs ; as *Augendo quantitatem*—By increasing the quantity.

RULE VI.

The Genitive case primarily signifies the class to which a thing belongs ; therefore—

- 1) It depends on another noun as a notion which it qualifies or determines ; as, *pulveris granum*—a grain of powder.
- 2) Or it is used to signify the whole from which a part is taken ; as, *nimum doloris*—too much (of) pain.
- 3) Adverbs of quantity, time, place, &c., govern the partitive genitive ; as *satis aquæ*—enough (of) water.
- 4) Adjectives of plenty or want govern a genitive or ablative ; as, *dives quiniæ*—rich in quinia ; *dives aqua*—rich in water.

RULE VII.

Dative.—The sign of the dative case is *to* or *for*.

- 1) Adjectives which imply likeness or unlikeness, advantage or disadvantage, &c., govern the dative ; as, *ceræ similis*—like to wax.

- (b) Verbs of giving or imparting, &c., govern the dative, the indirect object as well as the accusative of the direct object: *contusam liquori redde*—return the bruise (substance) to the liquor.

RULE VIII.

Accusative.—The accusative was originally used to mark the immediate object of an action.

- (a) Transitive verbs in the active voice generally govern the accusative case; as, *citratem calcis lava*—wash the citra of lime.

- (b) The following prepositions govern the Accusative:—

<i>Ad</i>	To, at, for.	<i>Inter</i>	Between, among.
<i>Adversum, ad-</i>			
<i>versus</i>	Against, towards.	<i>Ob</i>	On account of.
<i>Ante</i>	Before.	<i>Per</i>	Through, by.
<i>Apud</i>	At, with.	<i>Pone</i>	Behind.
<i>Circum</i>	Around.	<i>Post</i>	After.
<i>Contra</i>	Against.	<i>Prope</i>	Near.
<i>Extra</i>	Outside.	<i>Secundum</i>	According to.
<i>Infra</i>	Below.	<i>Supra</i>	Above.

- (c) The following prepositions govern the Ablative as well as the Accusative:—

<i>In</i> (ac.)	Into; (ab.) in.		<i>Subter</i> (ac. and ab.)	Under.
<i>Sub</i> (ac.)	Under; (ab.) near.			

RULE IX.

The Ablative received its name because it signifies ablation or separation, the sign of which is *from*.

- (a) Cause, manner, means, instrument, time when, and place where, are put in the ablative; as, *balneo arenæ*—in bath of sand.

- (b) *Opus* and *usus* are followed by an ablative; as, *cibo opus est nobis*—we have need of food.

- (c) The definite answer to the questions “when” or “how” is expressed by a noun or pronoun and a participle in the ablative case, and is called the ablative absolute; *liquoribus omnibus mixtis*—all the liquors having been mixed.

The following prepositions govern the Ablative:—

<i>A, ab, abs</i> ...	Away, from, by.	<i>Præ</i>	Before, because
<i>Cum</i>	With.	<i>Pro</i>	For, before, according to.
<i>De</i>	Down, from, of, about.		

E, ex

Out of, from, after.

Sine

Without.

- (d) *Utor, abutor*, and a few other verbs govern the ablative as, *utatur sequenti*—let him use the following.

RULE X.

The imperative mood is used to express requests or commands ; as, *Recipe*—Take (thou).

(a) The present subjunctive mood is often used instead of the imperative ; as, *fiat mistura*—let the mixture be made.

LATIN WORDS AND PHRASES MOST FREQUENTLY USED IN PRESCRIPTIONS, FULLY EXPLAINED.*

- Aa*, *Ana* (Greek preposition) of each.
A, *Ab*, prep. by or from (governs abl.)
Ad 3tiam vicem=*ad tertiam vicem*. For three times.
Ad lib.=*ad libitum*. (*ac.*, *s.*, *libitus-i*. Rule viii.) At pleasure.
Add.=*Adde*, *im*, *m*. (*addo*, *-didi*, *-ditum*, *-ere*.) Add.
Admov.=*Admove*, *im*, *m*. (*Admoveo*, *-vi*, *-tum*, *-ere*.) Apply.
Eger, *ægra*, *ægrum*, *adj*. Sick. (The patient.)
Albus (*-us*, *-a*, *-um*, *adj*.) White.
A. H., *Alternis Horis*. (*ab. pl.* Rule ix.) Every other hour.
Alvus (*-i*, *n. fem.*) The bowels.
Alvo Adst.=*Alvo adstrictâ*. The bowels being confined.
Amplus (*-us*, *-a*, *-um*, *adj*.) Large.
App.=*Applicandum*. (*-us*, *-a*, *-um*, *gerundive*.) To be applied.
Aq.=*Aqua*. (*-æ*, *n. f.*) Water.
Aq. Bull.=*Aqua Bulliens*. (*-entis*, *adj*.) Boiling water.
Com.= „ *Communis*. (*-is*, *-e*, *adj*.) Common „
Dest.= „ *Destillata*. (*-us*, *-a*, *-um*, *adj*.) Distilled „
Ferv.= „ *Fervens*. (*-entis*, *adj*.) Hot „
Font.= „ *Fontalis*. (*-is*, *-e*, *adj*.) Spring „
Mar.= „ *Marina*. (*-us*, *-a*, *-um*, *adj*.) Sea „
Niv.= „ *Nivalis*. (*-is*, *-e*, *adj*.) Snow „
Pluv.= „ *Pluvialis*. (*-is*, *-e*, *adj*.) Rain „
Auris (*-is*, *n. f.*) The ear.
At (*conj.*) Or.
Balneum (*-ei*, *n*, *neu.*) A bath.
Bene (*adv.*) Well.
Bibo (*bibere v. 3rd conj.*) To drink.
Bis Ind.=*Bis Indies*. (*adv.*) Twice a day.
P. or Ph. B.=*Pharmacopœia Britannica*, British Pharmacopœia.

ABBREVIATIONS USED.—*ab.*, or *abl.*, ablative ; *ac.*, accusative ; *ad.*, or *adj.*, adjective ; *adv.*, adverb ; *conj.*, conjunction ; *f.*, feminine ; *gen.*, genitive ; *im.*, imperative ; *indec.*, indeclinable ; *indef.*, indefinite ; *irr.*, irregular ; *m.*, or *masc.*, masculine ; *m.*, or *mo.*, mood ; *n.*, or *no.*, noun ; *nom.*, or *no.*, nominative ; *num.*, numeral ; *neu.*, neuter ; *pas.*, passive ; *part.*, participle ; *pr.*, or *pres.*, present ; *pl.*, plural ; *prep.*, preposition ; *pron.*, pronoun ; *sing.*, singular ; *sub.*, subjunctive ; *t.*, tense ; *tr.*, transitive ; *v.*, verb.

- Brachium (-ii, n. neu.) The arm.
 C.=Cum. (*prep. gov. abl.* See Rule ix.) With.
 Calidus (-us, -a, -um, adj.) Warm.
 Calor (-oris, n. masc.) Heat.
 Capió (See Cpt.) To take.
 Caput (-itis, n. neu.) The head.
 Cataplasma (-atis, n. neu.) A Poultice.
 Ceratum (-i, n. neu.) An ointment or cerate.
 Charta (-æ, n. f.) A powder or a paper.
 Cibus (-i, n. masc.) Food.
 Circa (*prep. gov. accus.*) Around.
 Coch.=Cochlear, Cochleare, or Cochlearium. (n. neu.) A spoonful.
 Coch. Amp.=Cochlear (-aris) Amplum. (-us, -a, -um, adj.) A table-spoonful.
 „ Mag.=Cochlear, (-aris) Magnum. (-us, -a, -um, adj.) A large spoonful ; or a table-spoonful.
 „ Med.=Cochlear (-aris) Medium or Modicum. (-us, -a, -um, adj.) A dessert-spoonful.
 „ Min.=Cochlear (-aris) Minimum. (-us, -a, -um, adj.) A small tea-spoonful.
 „ Parv.=Cochlear (-aris) Parvum. (-us, -a, -um, adj.) A tea-spoonful.
 Cochleat.=Cochleatim. (*Adv.*) By spoonfuls.
 Cœna (-æ, n. f.) Supper.
 Coll.=Collyrium. (-ii, n. neu.) An eye-wash.
 Colo (-avi, -atum, -are, v. a.) To strain.
 Co.=Compositus. (-us, -a, -um, adj.) Compound.
 Comp.=Compositus. (-us, -a, -um, part.) Compounded.
 Confectio (-onis, n. f.) A confection or electuary.
 Cong.=Congius. (-ii, n. masc.) A gallon.
 Conserva (-æ, n. f.) A conserve or electuary.
 Coq.=Coque. (*coquo, -xi, -ctum, -ere, v., im. m.*) Boil.
 Cpt.=Capiat. (*pr. sub, 3rd per. s., capio, cepi, captum, caper* Rule x.) Let the patient take.
 Cras (*adv.*) To-morrow.
 Crus (*Cruris, n. neu.*) The leg.
 Cuj.=Cujus. (*gen. s. of qui, quæ, quod.*) Of which.
 Cum (*prep. gov. abl.*) With.
 Cyath.=Cyathus. (-i, n. masc.) A glass.
 C. Vinar.=Cyathus Vinarius. A wine-glass.
 D.=Dosis. (*Dosis, n. f.*) A dose.
 Da { Da. (*do, dedi, datum, dare, imp. m.,* } Give ;
 Det. { =Detur. (*pres. sub., 3rd p. s.*) } Let it be given.
 Decoctum (-i, n. neu.) A decoction.
 Decub.=Decubitus. (-us, -a, -um, part.) Lying down.

- De d. { De die (-es, -ei, *n. masc. ab. s.* Rule ix.) } From day
n d. { = in diem. Rule viii. } to day.
- Dej. { Dejectiones (-onum, *n. pl.*) } Stools, or motions
Alv. { = Alvi. (-i, *n. f. gen. s.*) } of the bowel.
- Dens (*dentis, n. m.*) A tooth.
- Dexter (-tra, -trum, *adj.*) Right.
- Dieb. { Diebus (-es, -ei, *n. ab. pl.* Rule ix.) } Every
Alt. { = Alternis. (-us, -a, -um, *adj. pl. ab. m.* Rule ii.) } other day.
- Digitus (-i, *n. m.*) A finger.
- Dim. = Dimidius. (-us, -a, -um, *adj.*) One half.
- Div. = Divide. (-do, -visi, -visum, -dere, *im. m.*) Divide.
- Div. { Dividatur (-vido, -visi, -sum, -ere, *v. 3rd* } Let it be
{ per. *s. prs. pass. sub.*) } divided
in { = in (prep. gov. partes. Rule viii.c.) } into
p. { partes (*n. ac. pl., gov. by in*) } parts
Æq. { Æquales (*adj., agreeing with partes.*) } equal.
- Dolor (-oris, *n. masc.*) Pain.
- Donec (*conj.*) Until.
- Durant. { Durante (-ans, -antis, *part.*) } While the pain
Dolor. { = Dolore. (-oris, *n. masc.*) } lasts.
- Dos. = Dosis. (-is, *accusative dosin, n. f.*) A dose.
- Drachma (-æ, *n. f.*) A drachm.
- Dulcis (-is, -is, -e, *adj.*) Sweet.
- Dum (*adv.*) Whilst.
- Duo (*duo, -æ, -o, adj.*) Two.
- E or Ex (*prep. gov. abl.*) Out of.
- EjUSD. = Ejusdem. (*idem, eadem, idem, gen. s.*) Of the same.
- Effervescentia (-æ, *n. f.*) Effervescence.
- Elect. = Electuarium. (-ii, *n. neu.*) An electuary.
- Emesis (-is, *n. f.*) Vomiting.
- Emplastrum (-tri, *n. neu.*) A plaster.
- Enema (-atis, *n. neu.*) An enema or clyster.
- Et (*conj.*) And.
- Extractum (-i, *n. neu.*) An extract.
- F. = Fac. (*facio, feci, factum, facere, imp. m., 2nd p. s.*) Make.
- Facies (-ei, *n. f.*) The face.
- Febris (-is, *n. f.*) Fever.
- Febricula (-æ, *n. f.*) Fever.
- Fer. = Ferrum. (-i, *n. neu.*) Iron.
- Ferv. = Fervens. (-ens, -ens, -entis, *adj.*) Hot.
- Flatus = (-us, *n. masc.*) Flatulence.
- Flavus (-us, -a, -um, *adj.*) Yellow.
- Flos (-oris, *n. masc.*) A flower.
- Fol. = Folium. (-ii, *n. neu.*) A leaf.
- Frigidus (-a, -um, *adj.*) Cold.
- Frequenter (*adv.*) Frequently.

- Ft.=Fiat. (*fio, factus, fieri, pres. sub. 3rd s.*) Let it be made.
 Ft.=Fiant. (" " " " " " " *pl.*) Let them be made.
 Garg.=Gargarisma. (*-matis, n. neu.*) A gargle.
 Genu (*-us, n. neu.*) The knee.
 Gradatim (*adv.*) By degrees.
 Gr.=Granum. (*-i, n. neu.*) A grain.
 Gtt.=Gutta. (*-æ, n. f.*) A drop.
 Guttat.=Guttatim. (*adv.*) By drops.
 H.=Hora. (*-æ, n. f.*) An hour.
 Haust.=Haustus. (*-us, n. masc.*) A draught.
 Hebdomas (*-adis, n. f.*) A week.
 Heri (*adv.*) Yesterday.
 Hodie (*adv.*) To-day.
 Hora (*-æ, n. f.*) An hour.
 H.S.S.=Hora Somni Sumendum. To be taken at bed-hour.
 Idem (*Idem, eadem, idem, pron.*) The same.
 In (*prep. gov. abl. or acc.*) In or into.
 In d.=In-dies. (*adv.*) From day to day or daily.
 Injectio (*-onis, n. f.*) An injection.
 Infra (*prep. gov. acc.*) Below.
 Infrico (*-cui, -ctum, and -catum, -are.*) To rub in.
 Infusum (*-i, n. neu.*) An Infusion.
 Intime (*adv.*) Thoroughly.
 Jecur (*jecoris, n. neu.*) The liver.
 Latus (*-eris, n. neu.*) The side.
 Laxativus (*-us, -a, -um, adj.*) Laxative.
 Levis (*-is, -is, -e, adj.*) Light.
 Libra (*-æ, n. f.*) A pound.
 Lin.=Linimentum. (*-i, n. neu.*) A liniment.
 Liquidus (*-us, -a, -um, adj.*) Liquid.
 Liquor (*-oris, n. masc.*) A liquid.
 Lytta (*-æ, n. f.*) Cantharides.
 Lotio (*-onis, n. f.*) A lotion.
 Macero (*-avi, -atum, -are.*) To macerate.
 Mag.=Magnus. (*-us -a, -um, adj.*) Large.
 Mane (*indecl. neu. n.—used adverbially.*) In the morning.
 Mane Primo (*adv.*) Very early in the morning.
 M.=Massa. (*-æ, n. f.*) A mass.
 M.=Misce (*misceo, miscui, mistum, miscere, pres. imper.*) Mix
 M. or Min.=Minimum (*-i, n. neu.*) A minim.
 Med.=Medicamentum (*-i, n. neu.*) A medicine.
 Medius (*-us, -a, -um, adj.*) Middle.
 Mensura (*-æ, n. f.*) A measure or by measure.
 Meridies (*-ei, n. masc.*) Mid-day or noon.
 Mist.=Mistura (*-æ, n. f.*) A mixture.
 Mitte (*mitto, misi, missum, mittere, 2nd p. s. pres. imper.*) Send
 Modicus (*-us, -a, -um, adj.*) Middle-sized.

- Mol.=Mollis (*-e, adj.*) Soft.
- More dict.=More dicto. (*more, mos, -ris, n. masc.; dicto, dico, xi, -ctum, -ere, participle.*) In the manner directed.
- M.D.U.=More dicto utendum (*utendus, -a, -um; gerundive of utor.*) To be used as directed.
- More Sol.=More solito. (*solitus sum, solere, v. neu. passive.* To be accustomed.) In the usual manner.
- Morbus (*-i, n. masc.*) Disease.
- M.P.=Massa Pilularis. A pill mass.
- Nig.=Niger (*-ra, -rum, adj.*) Black.
- Nisi (*conj.*) Unless.
- Nox (*noctis, n. f.*) Night.
- N.P.=Nomen Proprium. The proper name.
- Nux (*nucis, n. f.*) A nut.
- Octarius (*-ii, n. masc.*) A pint.
- Oculus (*-i, n. masc.*) An eye.
- Oleum (*-ei, n. neu.*) Oil.
- Om.=Omnis (*-is, -is, -e, adj.*) All; every.
- Omn. Hor.=Omni Hora. (*-æ n. f.*) Every hour.
- Omn. Quadr. Hor.=Omni Quadrante Horæ. (*Quadrans, -tis, ab. f.*) Every quarter of an hour.
- Ope (*ops, opis, n. f. ab. s.*) Rule ix. (a) By the aid of.
- Optimus (*-us, -a, -um, adj.*) Best.
- Opus (*operis, n. neu.*) Need or occasion.
- Pars (*-tis, n. f.*) A part.
- P. Æ.=Partes Æquales (*-is, -is, -e, adj.*) Equal parts.
- Parvulus (*-us, -a, -um, adj.*) Very little.
- Paul.=Paululus. (*-us, -a, -um, adj.*) Little.
- Parvus (*-us, -a, -um, adj.*) Little; small.
- Pectus (*-oris, n. neu.*) The breast.
- Per (*prep. governs acc.*) Through.
- Pes (*pedis, n. masc.*) The foot.
- Pil.=Pilula (*-æ, n. f.*) A pill.
- Pocul.=Poculum (*-i, n. neu.*) A cup; a little cup.
- Pollex (*-icis, n. mas.*) The thumb.
- Pone (*prep. gov. acc.*) Behind.
- Post (*prep. gov. acc.*) After.
- Postea (*adv.*) Afterwards.
- Post singulas dejectiones liquidas. After each loose motion.
- P.P.A.=Phiala prius agitata—(*ablative absolute.*) The bottle having been first shaken.
- Prandium (*-ii, n. neu.*) Dinner.
- Primus (*-us, -a, -um, adj.*) First.
- P.R.N.=Pro re nata (*adverbial phrase.*) Occasionally, or according to circumstances.
- Pro (*prep. gov. abl.*) Before.
- Pulmo (*-onis, n. masc.*) A lung.

Pulv.=Pulvis (*-veris, n. masc.*) A powder.

Q.Q.=Quaque *f.* or Quoque *masc.* (*quisque, quæque, quodque, abl. s. indef. prn.*) Each or every.

Q.S. $\left\{ \begin{array}{l} \text{Quantum (adv.)} \\ \text{= Sufficiat. (sufficio, -feci, -fectum, -ere.)} \end{array} \right\} \begin{array}{l} \text{As much as} \\ \text{is sufficient.} \end{array}$

Quaque Hora (*abl. of quisque, quæque, quodque, pron.*) Each hour.

Quartus (*-us, -a, -um, adj.*) Fourth.

Quintus (*-us, -a, -um, adj.*) Fifth.

Quor.=Quorum (*qui, quæ, quod, pron.*) Of which.

Quater (*adv.*) Four times.

Quibus (*qui, quæ, quod, rel. pron. ab. pl.*) From which.

Quotidie (*adv.*) Daily.

R.=Recipe (*recipio, recepi, receptum, recipere, im. m.*) Take thou.

Rad.=Radix (*-icis, n. f.*) A root.

Rec.=Recens (*-ens, -ens, -ens, adj.*) Fresh.

Repet. $\left\{ \begin{array}{l} \text{Repetatur (repeto, -ivi, -itum,} \\ \text{-ere, sub. m. 3rd s.)} \end{array} \right\} \text{Let it be repeated.}$

$\left\{ \begin{array}{l} \text{Repetantur (3rd pl.)} \end{array} \right\} \text{Let them be repeated}$

S.A.=Secundum Artem (*secundum. prep.; ars, artis, n. f.*) According to Art.

Sæpe (*adv.*) Often.

Scrupulus (*-i, n. masc.*) A scruple.

Secundus (*-us, -a, -um, adj.*) Second.

Sem.=Semen (*-inis, n. neu.*) Seed.

Semiuncia (*-æ, n. f.*) A half-ounce.

Separatim (*adv.*) Separately.

Sesquih.=Sesquihora (*sesquihora, -æ, n. f.*) An hour and a half.

Sextus (*-us, -a, -um., adj.*) Sixth.

Si (*conj.*) If.

Sig.=Signa (*signo, -avi, -atum, -are, im. m.*) Mark thou.

Simul (*adv.*) Together ; at the same time.

Sine (*prep.*) Without (*gov. abl.*)

Sing.=Singulorum (*singulus, -a, -um, adj.*) Of each.

Si op. sit=Si opus sit. If necessary.

Sit (*sum, fui, esse, p. sub.*) Let it be.

S.N.=Secundum Naturam (*-a, -æ, n. f.*) According to nature.

Solve (*solvo, solvi, solutum,olvere.*) Dissolve.

Somnus (*-i, n. masc.*) Sleep.

Spt.=Spiritus (*-us, n. masc.*) Spirit.

Ss.=Semis (*-is, -issis, n. masc.*) A half.

S.S.=Statim Sumendum. To be taken immediately.

St.=Sumat (*sumo, sumpsi, sumptum, sumere, pr. sub.*) 1
him take.

Stat.=Statim (*adv.*) Immediately.

Sub (*prep. gov. acc. or abl.*) Under.

- Subinde (*adv.*) Frequently.
 Suc.=Succus (*-i, n. masc.*) Juice.
 Sum.=Sume (*sumo, sumpsi, sumptum, sumere, im. m.*) Take.
 Super (*prep. gov. acc. or abl.*) Over.
 Supra (*prep. gov. acc.*) Above.
 Syrupus (*-i, n. masc.*) Syrup.
 Talis (*talis, talis, tale, adj.*) Such.
 Ter (*adv.*) Thrice.
 Tere (*tero, trivi, tritum, terere, im. m.*) Rub.
 Tertius (*-us, -a, -um, adj.*) Third.
 Thorax (*-acis, n. masc.*) The chest.
 Tr. or Tinct.=Tinctura (*-æ, n. f.*) A tincture.
 Trit.=Tritura (*trituro, triturare, im. m.*) Triturate ; grind.
 Tussis (*-is, n. f.*) A cough.
 Una (*adv.*) Together.
 Uncia (*-æ, n. f.*) An ounce.
 Ungt.=Unguentum (*-i, n. neu.*) An ointment.
 Unus (*-a, -um, adj.*) One.
 Ut Dict. { = Ut Dictum. As directed.
 Utend. { = Utendum (*-us, -a, -um, gerundive.*) To be used.
 Vac. Ven.=Vacuo Ventriculo (*adj. & n., ab. sing. Rule ix. (a.)*)
 On an empty stomach.
 Vel (*conj.*) Or.
 Vena (*-æ, n. f.*) A vein.
 Venenum (*-i, n. neu.*) Poison.
 Ver.=Verus (*-us, -a, -um, adj.*) Genuine.
 Vesicatorius (*-us, -a, -um, adj.*) Blistering.
 Vesp.=Vesper (*-eris, n. masc.*) The evening.
 Vetus (*-us, -us, -us, adj.*) Old.
 Vices (*n. f. defective.*) Time.
 Viginti (*numeral adj. indec.*) Twenty.
 Vinum (*-i, n. neu.*) Wine.
 Virus (*-i, n. neu.*) Poison.
 Vitellus (*-i, n. masc.*) Yolk (*i.e. of egg.*)
 Vomicus (*-us, -a, -um, adj.*) Nauseating.
 Vomitus (*-us, n. masc.*) Vomiting.
 Vulnus (*-eris, n. neu.*) A wound.

GROUPS OF THERAPEUTIC AGENTS.

As the *junior* student will be frequently meeting in the *Materia Medica* portion of this work with words whose meaning he cannot understand, the following brief glossary is inserted here, not as an attempt to classify remedies, but merely for facility of reference, in order to explain terms in constant use which apply to many groups of well-known remedies.

There are *two* well recognised and often-mentioned effects of a remedy—the Physiological and the Therapeutical—and the student should be familiar with both these terms.

By the Physiological action of a medicine is generally meant the effects which the medicine will produce when administered to a patient in *health*; though it should be remembered that to produce these effects a perfect healthy state is not *necessary*. Thus, if 10 or 20 grs. of quinine be administered to a perfectly healthy subject, the constitutional effect of the remedy soon shows itself in the characteristic group of symptoms called cinchonism. This is spoken of as the Physiological or Primary action of quinine. If a medicinal dose of this drug be administered to a patient ill with the ague or neuralgia, it will be found to remove the disease; this is the Therapeutical or Secondary effect of the remedy. Suppose, however, the dose be a very large one; as in the first instance, the remedy may produce cinchonism, even though the patient have ague or neuralgia, and in this case the effects would still be called Physiological. It will thus be understood that, in administering a remedy in disease, the physician often desires it to be given in such a quantity that the *Physiological* effects of the drug should be made evident, as in treating syphilis with mercury, chorea with arsenic, paralysis with strychnine, or pertussis with belladonna.

To discuss the different theories which have from time to time prevailed about the way in which medicines produce their effects in the system, is beyond the intention of a short work like this. Under the name of each drug, in the Therapeutical part of this book, will be found a description of the way in which each is known or supposed to act. It will be hardly necessary to remind the student that the great bulk of remedies, after being swallowed, speedily find their way into the circulating fluid, accelerated or retarded by their crystalloid or colloid nature, and the well-known laws of osmosis. By the blood they are carried to the different tissues or glands, upon which they produce their characteristic effects, and by which, in many instances, they are eliminated or thrown out of the body. Why they exercise their peculiar selective power over these particular tissues and organs is a question which, with our present knowledge, we can hardly attempt to explain.

There are several terms constantly employed in the description of the actions of drugs which are unfortunately used in different senses by different writers. The *local* or *direct* action of a drug is seen in the case of swallowing a corrosive poison which injure the mucous lining of the stomach. Its *remote* or *indirect* action would be seen in the stoppage of the heart which might result from its *secondary* influence upon the nerves and circulation. The *primary* or *immediate* action of a dose of croton oil would be

to clear out the intestinal canal, its *secondary* or *remote* action might be to remove dropsical effusion in the brain or cellular tissue, or to relieve uræmia.

Acids—Though these are always regarded as a group of remedies belonging to a chemical classification, the recent additions to our knowledge of the effects of acid substances justify the mention of them as a group in a Therapeutical list. They are medicines which, in the concentrated form, act mostly as caustics, and when given in medicinal doses possess the power of *checking the acid secretions* of the body with which they come in contact, and, at the same time, they *directly increase alkaline secretions*. It is by this theory that Ringer explains their use in acid dyspepsia, sweating, &c. The principal members of the group are hydrochloric, acetic, nitric, sulphuric, phosphoric, nitro-hydrochloric, and citric acids.

Alkalies or Antacids—Under this head are included substances which have the power of *checking alkaline* and *stimulating* or *increasing acid secretions*. The most important are—caustic soda and potash, with their carbonates, bicarbonates, acetates, and citrates; ammonia, and magnesia, with their preparations. Of this class, there are those which act *directly*, as soda does upon the gastric membrane, and those which also act *indirectly* through the blood.

Alteratives are a class of remedies which, when administered, cure disease without producing any obvious impression on any of the organs of the body; and because the way in which they act is not understood, or capable of demonstration, in the present state of our ignorance, they are said to *alter* the morbid processes, and hence are called “Alteratives.” The most important of this class are antimony, mercury, arsenic, iodine, colchicum, and their preparations.

Anaphrodisiacs are medicines which weaken the sexual functions, as camphor, bromides of ammonium and potassium, tobacco, hemlock, iodide of sodium and potassium.

Anæsthetics are medicines which produce loss of sensation and consciousness from their effects upon the brain and spinal centres. The term is usually restricted to volatile substances, like chloroform, ether, bromoform, nitrous oxide gas, &c., and does not include narcotics, like alcohol and opium, which likewise produce anæsthesia.

Anæsthetics (Local) are agents which, when applied directly to a part, destroy its sensibility by their action on the sensory nerves, without injuring the tissues—as ether in the form of spray, cocaine, carbolic acid, ice, veratrine, &c.

Analgesics or Anodynes are remedies which relieve pain by their action on the brain, or their influence over the conductivity of the sensory nerve fibre, as opium, Indian hemp, belladonna, aconite, chloroform, antifebrin, antipyrine, &c.

Anhidrotics are medicines which restrain profuse perspiration. They act by (1) paralyzing the terminals of the nerves going to the sweat glands, or (2) by their influence upon the gland cells, or (3) upon the sweat centres, or (4) the circulation, as belladonna, atropine, hyoscyamus, stramonium, muscarine, quinine, zinc salts, the vegetable and mineral astringents, and picrotoxin in small doses.

Antacids. (See Alkalies).

Anthelmintics, Vermifuges, or Antiscolics are medicines which destroy or cause the expulsion of worms, as san-tonin for the *round* worm, kousso, kamala, male-fern, turpentine, areca nut, and pomegranate for the *tape* and *broad* worms, and injections of salt, tannin, quassia, alum, iron, lime water, &c., for the *thread* worm.

Antagonists are medicines which act in direct opposition to each other, as atropine and muscarine; atropine and hydrocyanic acid; atropine and physostigmine; atropine and pilocarpine; digitalin and saponin; chloral and strychnine; opium and belladonna; alcohol and strychnine.

1713 **Antidotes** are medicines that relieve or remove the symptoms caused by poisons. Antidotes are chemical, as lime for sulphuric acid; physiological, as strychnine for woorara; or vital, as mercury for syphilis.

Antilithics or Lithontriptics are medicines supposed to possess the power of dissolving various concretions in the body, as the acids for phosphatic, and the alkalies for the uric acid calculi; and Castile soap and salicylate of soda for gall-stones.

Antiparasitics are medicines which destroy minute parasites—as sulphurous and carbolic acids, iodide of sulphur, and various mercurial salts, and the innumerable list of antiseptics.

Antiperiodics are medicines which antagonise the poison of periodic disorders like ague. The principal members of the group are quinine, arsenic, iodine, and beberine.

Antiphillogistics are remedies which are supposed to possess the power of subduing inflammations—as mercury, aconite, veratrum viride, purgatives, antimony, venesection, &c.

Antiseptics are medicines which prevent putrefaction by destroying or arresting the growth and development of the germs, upon whose presence putrefaction depends. Carbolic acid may be taken as the type of this class. They should not

be confounded with Disinfectants like hot air, which destroy the germs causing disease, or with Deodorants like chlorine or charcoal, which destroy fetid smells and emanations.

Antisialics are remedies used to diminish or check the secretions of the salivary glands, as atropine, and physostigma in large doses.

Antipyretics are remedies which reduce the temperature in fevers and diseased conditions. They do so either (1) by lessening the production of heat, through their effect on the nervous system, as antipyrine, antifebrin, quinine, salicin, &c., or (2) by destroying the poison which causes the fever, as arsenic and iodine in ague, or (3) by their action on the skin or circulation, as alcohol, antimony, aconite, &c., or (4) they may act by extracting the heat, as the cold bath and diaphoretics and sudorifics do.

Antispasmodics—Several distinct groups of remedies are included under this heading.

(1) Medicines which *paralyse* the motor centre, as Calabar bean and woorara, or which merely *depress* them, as bromides of potassium and ammonium.

(2) Medicines which produce profound general depression of all the vital functions, as tobacco, aconite, lobelia, hellebore, prussic acid; and many remedies called sedatives.

(3) Medicines which, by stimulating the bowel, cause the expulsion of gas and relieve colic, as asafoetida, cajuput, castor, valerian, and a host of remedies called Carminatives and Aromatics.

(4) Medicines which overcome spasm of the bronchial tubes, as stramonium, belladonna, hyoscyamus, &c.

Aphrodisiacs are medicines which increase the sexual appetite and excite the functions of the genital organs, as phosphorus, cantharides, strychnine, damiana, cannabis indica, &c. They act directly upon the genital nerve centres in the cord and brain, as strychnine, or indirectly by irritating the bladder and urethra, as cantharides.

Astringents are remedies which cause contraction of muscular fibre, and condensation of the tissues, mostly by precipitation of gelatine and albumen. The most important are tannic and gallic acids, and all substances containing them, the mineral acids, and most metallic salts, alum, creasote, &c.

Carminatives. (See Antispasmodics).

Cathartics, Aperients, Evacuants, or Purgatives are medicines which increase or quicken the evacuations from the bowel. They are variously sub-divided:—

a. *Laxatives*, which slightly quicken the peristaltic move-

ments, and cause only *softened* motions, as manna, sulphur, figs, prunes, olive oil, &c.

b. Purgatives proper or simple purgatives, which, by increasing the movements of the intestines and stimulating the glands, cause *semi-fluid* motions, as senna, castor oil, mercurials, aloes, &c.

c. Drastics, which act like the former class, only more intensely, and by their local irritant action increase the intestinal fluid, and remove the serum from the intestinal vessels, causing *almost fluid* motions—as scammony, jalap, colocynth, gamboge, podophyllin, and large doses of class *b*.

d. Hydragogues, which cause *free* secretion from the intestinal glands, and remove much serum from the blood vessels, producing *fluid* or *watery* motions, as croton oil, elaterin, and many of the remedies in class *c*; and large doses of various salts, like cream of tartar, Epsom, Glauber, &c., which are often called *saline* purgatives, and which are supposed to act by virtue of their low diffusive powers.

e. Cholagogue Purgatives are remedies which are supposed to purge by stimulating the liver and increasing the bile, or by concentrating their action upon the duodenum they cause the bile to be swept out of the body before it has time to be re-absorbed by the intestinal surface (calomel and podophyllin); they produce *greenish liquid* motions; most brisk purgatives are included in this class by writers, as aloes, iridin, mercurials, rhubarb, euonymin, &c. *have no action on the Liver.*

Cholagogues. (See Cathartics.) The term is sometimes used to include such mild hepatic stimulants as the dilute nitrohydrochloric acid, soda salts, and the chloride of ammonium.

Ciliary Excitants are medicines which, when sucked in the mouth, promote expectoration of bronchial mucus by reflex action—as chloride of ammonium, chlorate of potassium, gum acacia, native chloride of sodium, &c.

Counter-Irritants—Under this heading are included—RUBEFACIENTS, remedies which cause redness of the skin; EPISPASTICS, or VESICANTS, which produce inflammation, ending in the formation of a blister; REVULSIVES and DERIVATIVES, remedies which are supposed to remove the diseased action from the seat of mischief to the place of their application. Amongst this class are cantharides, turpentine, ammonia, camphor, mustard, most volatile oils, mezereon, capsicum, croton oil, &c.

Demulcents are medicines which protect the parts with which they come in contact, by their oleaginous or mucilaginous qualities shielding them from irritating secretions. Linseed, olive, and almond oils, starch, glycerine, liquorice, &c., are included under this head.

Diaphoretics are medicines which increase the cutaneous secretion, either by stimulating the terminal nerves in the cells of the sweat glands, as pilocarpine does, or by causing the dilatation of the superficial capillaries, as antimony, ipecacuanha, and all depressing remedies ; or by stimulating the sweat centres in the spinal cord, as the spirit of nitrous ether.

Diluents are remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin.

Disinfectants and **Deodorants** are referred to under Antiseptics.

Diuretics are remedies which increase the renal secretion. *Stimulating diuretics* act by stimulating the kidneys during their elimination, as copaiba, cubeb, turpentine, pepper, gin, alcoholic liquors, buchu, cantharides, juniper, &c. *Hydragogue diuretics* act by raising the blood pressure in the glomeruli, as digitalis, squill, casca, broom, caffeine, &c. *Refrigerant diuretics* act by washing out the kidneys, as large doses of diluents, like water, and solutions of the various potash salts.

Ecbolics are medicines which cause contraction of the uterine muscular fibre, as ergot, borax, savin, quinine, &c. ; in smaller doses they are emmenagogue.

Emetics are medicines which cause the evacuation of the contents of the stomach. They are divided into (1) *Local* Emetics, as zinc and copper sulphates, mustard, carbonate of ammonia, warm chamomile infusion, and solution of common salt, alum, &c., which act locally by irritating directly the nerves distributed to the gastric mucous membrane. (2) *General* Emetics, which act through the blood upon the vomiting centre, as tartar emetic, ipecacuanha, senega, squill, and apomorphine. Most of these latter drugs are eliminated by the gastric mucous membrane after absorption, and then also act partly as local emetics. Apomorphine may, however, be regarded as a pure general emetic.

Emmenagogues are medicines which, by their stimulating action on the uterine fibre (1) directly assist in restoring disordered menstruation, as ergot, savin, and most ecbolics ; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, &c.

Emollients or Protectives are external Demulcents, which protect and soothe the parts to which they are applied from all sources of irritation ; or, by their oily nature, they help to relax and soften the tissues, as hot fomentations, poultices, oils, lard, spermaceti, chalk, starch, &c.

Errhines are medicines which increase the secretion of the nasal mucous membrane generally without causing sneezing, as the vapour of ammonia, acetic acid, &c. The term is, however, often applied also to sternutatories.

Escharotics or Caustics are substances which destroy the life of the tissue to which they are applied, generally by depriving it of its moisture—as the strong mineral acids, soda, potash, lime, arsenic, chloride of zinc, &c.

Expectorants are medicines which assist the expulsion of the bronchial mucus.—

(1) By relieving spasm of the bronchial tubes, as lobelia, opium, stramonium, tobacco, &c.

(2) By mechanically dislodging it in the act of vomiting, at the same time thinning the secretion, as all emetics *in large doses*, notably antimony, hippo, &c.

(3) By increasing the flow from the inflamed membrane, through their effects upon the vessels, as all the emetic class *in small doses*—*Nauseating or Depressant* expectorants—as apomorphine, pilocarpine, emetine, and tartar emetic.

(4) By stimulating the membranes in the act of their elimination, they so alter the secretion that expectoration is rendered easy, as ammonia, senega, ammoniacum, and a host of volatile substances, notably the onion, tar, turpentine, balsams, asafoetida, &c. Iodide of potassium, by liquefying the secretion, is a valuable expectorant—*Stimulating* expectorants.

(5) By soothing the irritable respiratory centre, *morphine and chloral* may act as expectorants, and render the expulsion painless.

(6) By acting through the impression produced on the nerves of the mouth, *many substances aid expectoration*. (See Ciliary excitants.)

(7) By stimulating the respiratory centre, and strengthening the muscles of the expulsive mechanism, *strychnine and atropine* may act as true expectorants.

Galactagogues are medicines which increase the secretion of the mammary glands, as chlorate of potassium, fennel, &c.

Hæmatics or Hæmatinics are medicines which enrich the blood by acting as restoratives to the red corpuscles, as iron and its preparations, manganese, cod liver oil, free phosphorus, and lime phosphates, and potassium in small doses. They are also termed Blood Tonics.

Hypnotics or Soporifics are medicines which induce sleep without causing any previous cerebral excitement. *Sulphonal, chloral, paraldehyde, urethane, and the new sleep producers* belong to this class.

Mydriatics are remedies which cause dilatation of the pupil, paralysis of the ciliary muscle, and temporary loss of accommodation, as atropine, duboisine, belladonna, homatropine, daturine, &c. ; they are generally used for their local action.

Myotics are remedies which cause contraction of the pupil and diminution of ocular tension, as eserine, Calabar bean, pilocarpine, &c.

Narcotics are medicines which produce sleep by their action upon the cerebrum. They are to be distinguished by their initial exciting stage from pure Hypnotics, like chloral and bromide of potassium, &c. ; amongst them are opium, morphine, chloroform, Indian hemp, alcohol, and ether.

Refrigerants are medicines which reduce the temperature of the body in fever ; the term, however, is generally applied to a class of remedies which appear to allay thirst, as the vegetable acids, some mineral acids (much diluted), and many diaphoretics. (See antipyretics.)

Resolvents or Discussants are medicines which are supposed to cause the absorption of inflammatory or other swellings. They appear to act by stimulating the lymphatics, as iodine, cadmium, &c.

Restoratives are medicines which exist already in the healthy blood or tissues, and are given in diseases where the system is supposed to be deficient in them, as iron, potash, phosphorus, chloride of sodium, &c. They are identical with Hæmatinics (which see.)

Rubefacients. (See Counter-irritants.)

Sedatives or Depressants are medicines which depress the action of the (1) nervous system, as tobacco, lobelia, bromide of potassium, &c. ; (2) the circulatory system, as aconite, veratrum, Prussic acid, &c. ; (3) the spinal cord, as Calabar bean, &c.

Sialagogues are medicines which increase the secretion of the salivary glands, either by a local irritation of the mouth, causing reflex activity of the glands, as pellitory, mezereon, tobacco, mustard, capsicum, &c. ; or by exciting the glands during their elimination, as pilocarpine, muscarine, all the preparations of mercury, iodide of potassium, &c.

Sternutatories are substances which, by their local irritating action on the nasal mucous membrane, cause sneezing, as tobacco, hellebore, ginger, capsicum, and ipecacuanha, in powder.

Stimulants*—Under this head may be included a great number of remedial agents. The sub-divisions are vague and misleading; thus there are medicines which excite the spinal cord, as strychnine, phosphorus, &c.; such are called spinal stimulants; others exalt the functions of the liver, as cholagogues; others the intestines, as calomel, Epsom salt, &c.; others the circulatory system, as digitalis, belladonna, &c.; others the stomach, as carminatives, like spices, &c.; others the skin. These latter are called external stimulants, and include all the counter-irritants.

Stomachics are medicines which increase the vascularity of the stomach, promote digestion, and increase the appetite, as hippo, all the bitter tonics, arsenic, and aloes in small doses, &c.

Styptics are medicines which arrest bleeding by their local astringent action, either by causing coagulation of the blood, or by acting on the muscular tissue of the small vessels. Amongst this class will be found tannic acid, creasote, alum, chloride of zinc, perchloride of iron, &c.

Sudorifics. (See Diaphoretics.)

Tonics are, strictly speaking, medicines which improve the tone of the part upon which they act; thus it may be on the stomach, as the pure vegetable bitters and all stomachics; or on the cord, as strychnine; or on the heart, as digitalis; or on the nervous system, as quinine and the valerianates; or on the muscular tissues, as tannic acid; or on the circulating fluid, as iron.

Vermicides and Vermifuges. (See under Anthelmintics.) The term vermicide is sometimes restricted to a drug which causes the death of the worm, while vermifuge is applied sometimes to any drug which causes the expulsion of the worm, though it may not have power to cause its death.

Vesicants. (See Counter-irritants.)

* The term "stimulants" is frequently erroneously used as a synonym for alcohol and its preparations, which are true narcotics.

PART III.

MATERIA MEDICA.

PHARMACOPŒIAL PREPARATIONS* (INCLUDING THE ADDITIONS OF 1890.)

THE student having obtained some idea of the general processes of Pharmacy, should now glance at the groups of the preparations; but until he has mastered the Official Remedies he cannot expect to grasp all the information contained in this part of the subject; and hence, since these groups are of vital importance, he should repeatedly turn back to them during his study of the *Materia Medica*.

The Aceta or Vinegars of the Pharmacopœia are four in number :—

Acetum (Vinegar) contains 5·41 per cent. real acetic acid.

Acetum Cantharidis—2 oz. cantharides, 2 oz. glacial acetic, and 18 oz. acetic acid.

Acetum Ipecacuanhæ—1 oz. ipecacuanha in 1 pint diluted acetic acid.

Acetum Scillæ—2½ oz. squill to 1 pint diluted acetic acid.

Aquæ (The Waters—Sixteen in number), viz :—

Aqua—Pure natural water : filtered (if necessary).

Aqua Anethi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Anisi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Aurantii Floris—The water distilled from the fresh flowers of the bitter and sweet orange—*Citrus Vulgaris*, and *Citrus Aurantium*.

* These preparations are often called "Galenical" (*pertaining to Galen*) to distinguish them from those prepared from the extemporaneous formulæ of the physician, which are called "Magistral" (*because ordered by a magister or master of his profession*).

- Aqua Camphoræ**—A solution of camphor in water, about $\frac{1}{2}$ gr. to 1 oz.
Aqua Carui—One gal. distilled from 1 lb. of fruit and 2 gals. of water.
Aqua Chloroformi—A solution of 1 dr. chloroform in 25 oz. water.
Aqua Cinnamomi—One gal. distilled from $1\frac{1}{4}$ lb. of bark and 2 gals. water.
Aqua Destillata—Perfectly pure H_2O distilled from a copper still.
Aqua Fœniculi—One gal. distilled from 1 lb. fruit and 2 gals. water.
Aqua Laurocerasi—One pt. distilled from 1 lb. fresh leaves and $2\frac{1}{2}$ pts. water, and made to contain 1 per cent. real Hydrocyanic Acid.
Aqua Menthæ Piperitæ—One gal. distilled from $1\frac{1}{2}$ dr. oil and $1\frac{1}{2}$ gal. water.
Aqua Menthæ Viridis—One gal. distilled from $1\frac{1}{2}$ dr. oil and $1\frac{1}{2}$ gal. water.
Aqua Pimentæ—One gal. distilled from 14 oz. pimento and 2 gals. water.
Aqua Rosæ—One gal. distilled from 10 lbs. fresh petals and 5 gals. water.
Aqua Sambuci—One gal. distilled from 10 lbs. fresh flowers and 5 gals. water.

It should be remembered that all the waters are distilled except three—Aqua, Aqua Camphoræ, and Aqua Chloroformi, and that their doses all range from $\frac{1}{2}$ to 1 or 2 oz., except Aqua Laurocerasi, which contains Hydrocyanic Acid, and whose dose is only $\frac{1}{2}$ to 2 drachms.

Cataplasmata (Poultices—Six in number).

- Carbonis**—Wood charcoal $\frac{1}{2}$ oz., bread crumb 2 oz., linseed meal $1\frac{1}{2}$ oz., boiling water 10 oz.—1 in 28.
Conii—Hemlock juice 1 oz., linseed meal 4 oz., boiling water 10 oz.—1 in 15.
Fermenti—Beer yeast 6 oz., wheaten flour 14 oz., water at 100° 6 oz.—1 in $4\frac{1}{3}$.
Lini—Linseed meal 4 oz., boiling water 10 oz.—1 in $3\frac{1}{2}$.
Sinapis—Mustard $2\frac{1}{2}$ oz., linseed meal $2\frac{1}{2}$ oz., boiling water 10 oz.—1 in 6.
Sodæ Chlorinata—Solution of chlorinated soda 2 oz., linseed meal 4 oz., boiling water 8 oz.—1 in 7.

Of the six poultices, all are made with linseed meal for the basis, corpus, or body, as it is called, except the yeast poultice, and in all boiling water is used, except in the yeast.

The most important point in connection with poultice-making is to be quick when once the process is started, and have the vessels warmed before beginning, and always spread the poultice on flannel.

Charta (Papers—Two in number).

- Charta Epispastica**—Consisting of white wax 4 oz., spermaceti $1\frac{1}{2}$ oz. olive oil 2 oz., resin $\frac{3}{4}$ oz., cantharides 1 oz., water 6 oz.; digested in water bath for two hours. Reject the watery portion, add Canad balsam $\frac{1}{4}$ oz., and spread over slips of paper. It is a resinous solution of cantharidine spread upon paper.

- Charta Sinapis**—Paper smeared over with mustard in powder 1 oz., mixed with solution of gutta pereha 2 oz. It should be dipped in tepid water before use.

of Cataplasmae see their be
Carbonis and Fermenti
Conii Hæmæ + Ferri
Sinapis Sodæ Chlor.

Omit.

Omit.

Collodia (Collodions—3 in number).**Collodium**—Pyroxylin 1, Ether 36, Spirit 12.**Collodium Flexile**—Collodion 48, Canada Balsam 2, Castor Oil 1.**Collodium Vesicans**—Blistering Liquid 20, Pyroxylin 1.

Confections (8 in number). The last four are Cathartic, the first four faintly Astringent. Confections are soft preparations of a pasty consistence, containing a medicine blended with some form of sugar, either to preserve it, or to make its administration more agreeable. Under this heading are included the old Conserves and Electuaries.

CONFECTIO.	COMPOSITION.	STRENGTH.	DOSE.
Opii	Compound powder of opium 1 part, syrup 3 parts; mix.	1 in 40.	5 to 20 grs.
Piperis . . .	Powdered black pepper 2, powdered caraway fruit 3, honey 15; mix.	1 in 10.	60 to 120 grs.
Rosæ Caninæ	Hips, free from seeds, 1, beaten, sifted, and added to sugar, 2.	1 in 3	1 to 4 drs.
Rosæ Gallicæ	Fresh red rose petals 1, beaten with sugar, 3.	1 in 4.	1 to 4 drs.
Scammonii .	Scammony resin 48, ginger 24, oil of caraway 2, oil of cloves 1, syrup 48, honey 24; mixed, adding the oils last.	1 in 3.	10 to 30 grs.
Sennæ . . .	Powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind 9 oz., cassia pulp 9 oz., prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., water q.s. to 75 oz. Boil the figs and prunes in 24 oz. water for 4 hours; in this digest the cassia and tamarind for 2 hours; sift, add the sugar and liquorice, dissolve, add the senna and coriander, and make up to 75 ozs.	1 in 11.	60 to 120 grs.
Sulphuris . .	Sulphur 4 oz., cream of tartar 1 oz., syrup of orange peel 4 fl. oz., tragacanth 18 grs.; mix	1 in 2½.	60 to 120 grs.
Terebinthinæ	Oil of turpentine 1 oz., powdered liquorice 1 oz., honey 2 oz.; rub the first two, add the last, and mix thoroughly.	1 in 4.	60 to 120 grs.

Decocta (Decoctions—13 in number) are watery vegetable solutions prepared by boiling. All are made in a covered vessel, except Granati. Three contain more than one solid ingredient. (All are made with distilled water and strained.)

DECOCTIONS.

DECOCTUM.	COMPOSITION.	STRENGTH.	DOSE
Aloes Co. . .	Extract of socotrine aloes $\frac{1}{2}$ oz., myrrh, saffron, and carbonate of potassium, of each $\frac{1}{4}$ oz., extract of liquorice 2 oz., compound tincture of cardamoms 15 oz., water q.s. to 50 oz. Boil all for 5 minutes, except the saffron and tincture, in 1 pint of water; add the saffron, and when cooled add the tincture 2 hours before straining, and make up to 50 oz. with water.	4·3 grains in 1 oz.	$\frac{1}{2}$ to 2 oz.
Cetrariæ . .	Washed Iceland moss 1 oz., boiled for 10 minutes in 1 pint water, strained while hot, and made to measure 1 pint.	1 oz. to 1 pt.	1 to 4 oz.
Cinchonæ . .	Powdered red bark $1\frac{1}{4}$ oz., boiled for 10 minutes in 1 pint water, strained when cold, and made to measure 1 pint.	$1\frac{1}{4}$ oz. to 1 pt.	1 to 2 oz.
Granati Radicis	Bark of pomegranate root 2 oz., boiled in water 40 oz., down to 1 pint.	2 oz. to 1 pt.	2 to 4 oz.
Hæmatoxyli .	Logwood chips 1 oz., and cinchonamon 55 grs., boiled for 10 minutes in 1 pint water, and made to measure 1 pint.	1 oz. to 1 pt.	1 to 2 oz.
Hordei	Washed barley 2 oz., boiled in water $1\frac{1}{2}$ pint, for 20 minutes, and strained. Product about 1 pint.	2 oz. to 1 pt.	1 to 4 oz.
Papaveris . .	Bruised poppy capsules 2 oz., boiled for 10 minutes in $1\frac{1}{2}$ pint water, and made to measure 1 pt.	2 oz. to 1 pt.	used externally.
Pareiræ . . .	Pareira root $1\frac{1}{4}$ oz., boiled for 15 minutes in 1 pint of water, and made to measure 1 pint.	$1\frac{1}{4}$ oz. to 1 pt.	1 to 2 oz.
Quercus . . .	Oak bark $1\frac{1}{4}$ oz., boiled for 10 minutes in 1 pint water, and made to measure 1 pint.	$1\frac{1}{4}$ oz. to 1 pt.	used externally.
Sarsæ	Sarsaparilla $2\frac{1}{2}$ oz., digested in $1\frac{1}{2}$ pint boiling water for 1 hour, then boiled for 10 minutes, and made to measure 1 pint.	$2\frac{1}{2}$ oz. to 1 pt.	2 to 10 oz.
Sarsæ Co. . .	Sarsaparilla $2\frac{1}{2}$ oz., sassafras root, guaiacum wood and liquorice root, of each $\frac{1}{4}$ oz., mezereon bark $\frac{1}{8}$ oz., boiling water $1\frac{1}{2}$ pint, digested for 1 hour, then boiled for 10 minutes, and made to measure 1 pint.	$2\frac{1}{2}$ oz. to 1 pt.	2 to 10 oz.
Scoparii . . .	Dried tops of broom 1 oz., boiled for 10 minutes in 1 pint water, and made to measure 1 pt.	1 oz. to 1 pt.	2 to 4 oz.
Taraxaci . . .	Dried, sliced, and bruised dandelion root 1 oz., boiled for 10 minutes in 1 pint water, strained, and made to measure 1 pint.	1 oz. to 1 pt.	2 to 4 oz.

103 63 1/2 pint
 Dried, logwood washed Iceland bark, cinchonamon, red pomegranate root, (the) poppy
 up pomegranate roots, (the) poppy

Emplastra (Plasters—15 in number) are solid, adhesive applications for external use, either for support or intended to act as a local means of applying various active remedies. As the various ingredients are only added to the active medicine for the sake of such physical qualities as adhesiveness, softness, hardness, and the like, it is not necessary for the student to learn *their* proportions, and as the directions are complicated, and seldom required by the student of Pharmacy, who never makes them, he is referred to the name of the drug in the *Materia Medica*, where he will find the plasters amongst the other preparations of each remedy in the following pages:—

EMPLASTRUM.	ARTICLES EMPLOYED IN THE PREPARATION.	STRENGTH.
Ammoniaccum	Ammoniacum, mercury, olive oil, and sublimed sulphur.	1 of Hg in 5
Hydrargyro		
Belladonnæ ..	Alcoholic extract of Belladonna, resin plaster, and soap plaster.	1 in 5.
Calefaciens ..	Cantharides, expressed oil of nutmeg, yellow wax, resin, resin plaster, soap plaster, and boiling water.	1 in 24 of Cantharides.
Cantharidis ..	Cantharides, yellow wax, suet, lard, and resin.	1 in 3.
Ferri	Peroxide of iron, Burgundy pitch, and lead plaster.	1 in 11.
Galbani ..	Galbanum, yellow wax, ammoniacum, and lead plaster.	1 in 11.
Hydrargyri ..	Mercury, olive oil, sulphur, and lead plaster.	1 in 3.
Menthol ..	Menthol, yellow wax, and resin.	1 in 5.
Opii	Powdered opium and resin plaster.	1 in 10.
Picis	Burgundy pitch, frankincense, resin, yellow wax, expressed oil of nutmeg, olive oil, and water.	1 in 2.
Plumbi.. ..	Oxide of lead, olive oil, and water. No strength need be given, as it is chiefly <i>oleate of lead</i> , with a little glycerine.	
Plumbi Iodidi	Iodide of lead, lead plaster, and resin.	1 in 10.
Resinæ ..	Resin, lead plaster, and curd soap.	1 in 9½.
(Adhesive Plaster)		
Saponis ..	Curd soap, lead plaster, and resin.	1 in 7.
Saponis Fus-	Curd soap, yellow wax, olive oil, oxide	1 in 6.
cum.. ..	of lead, and vinegar.	(about.)

Enemata (Injections, Enemas, or Clysters—5 in number) are liquid preparations for introduction into the large bowel, where they may act either (1) as local sedatives, (2) by exciting reflex action they are expected to cause purgation, or (3) if used in very large quantity they act by washing out the bowel mechanically. (4) They may be injected with the idea of becoming absorbed into the system, and producing the consti-

tutional effect of the drug which they contain. Mucilage of starch is the basis of four, and water of one.

ENEMA.	ACTIVE PRINCIPLE.	BASIS.
Aloes	Aloes 40 grs., carbonate of potassium 15 grs.	Starch mucilage 10 oz.
Magnesii Sulphatis	Sulphate of magnesium 1 oz., olive oil 1 oz.	Starch mucilage 15 oz.
Opii	Tincture of opium $\frac{1}{2}$ dr.	Starch mucilage 2 oz.
Terebinthinæ ..	Oil of Turpentine 1 oz	Starch mucilage 15 oz.
Asafœtidæ	Asafœtida 30 grs., rubbed in a mortar with	Distilled water 4 oz.

Essentiæ (Essences—2 in number) are merely very strong spirits, consisting of a volatile oil dissolved in rectified spirit—one part in every five.

Essentia Anisi, 1 in 5, and Essentia Menthæ Pip., 1 in 5.

Extracta (Extracts—50 in number) are mostly semi-solid products, obtained by the evaporation of vegetable solutions.

There are five classes of extracts, if we divide them according to the methods directed for their preparation—

1. The Fresh or Green Extracts, as aconite, &c.
2. The Aqueous or Watery, as aloes and opium.
3. The Alcoholic, as physostigma and rhubarb.
4. The Ethereal, as mezereon.
5. The Liquid, as ergot and male fern.

The student should remember that these names have no connection with the *physical qualities* of the extract, except in the case of the liquid ones. Thus, the Fresh or Green extracts are either dark brown or black in colour; the Watery extracts may be of pilular consistence—like opium, or hard and brittle—like logwood and aloes.

The extracts may be, however, better divided, according to their consistence, into three well marked groups—

1. The *Semi-solid* or pilular extracts; of which there are 30.
2. The *Hard*, Dry, or Brittle, of which there are 5.
3. The *Fluid*, of which there are 15.

The Fluid extracts will be found in the table on page 138. The table on page 139 contains both the Solid and Semi-solid; but the student should remember that the Solid extracts are—*Extractum Aloes Barbadosis*, *Aloes Socotrinæ*, *Hæmatoxyli*, *Kramerix*, and *Euonymi Siccum*.

Aloe Barb. & Socotrinæ

Logwood Kramer. & Euonymi

PREPARATION OF EXTRACTS.

The Fresh or Green Extracts, of which there are eight, viz. :—

Aconite,
Belladonna,
Hemlock,

Hyoscyamus,
Colchicum,
Colchicum (acetic),

Lettuce,
Dandelion,

are prepared by expressing the juice of the leaves or plant, heating to 130° F., to coagulate the green colouring matter. This is separated and laid aside. The fluid is heated to 200° F. to coagulate all the albumen, which is useless, and which if retained would promote the decomposition of the preparation; it is consequently rejected. The fluid resulting is evaporated by the heat of a water-bath to a syrupy state. The colouring, previously separated, is now added, and the evaporation continued below 140° till the consistence of a soft pill mass is reached. In the case of Colchicum and Dandelion the juice is at first heated to the boiling point to coagulate the albumen, filtered and evaporated at a temperature under 160° .

The Watery Extracts (11 in number) are prepared by boiling, macerating, infusing, or digesting the substance in hot or cold distilled water, and evaporating the resulting decoction, infusion, or solution to a suitable consistence. Thus Aloes Barb. and Aloes Socot., Gentian, Logwood, Pareira, are made by exhausting with *boiling* water; so also is Poppies, only a little spirit is added to the cold evaporated infusion. Chamomile is made by first boiling, hence it is an evaporated *decoction*, to which a little essential oil is added. Liquorice, Krameria, Opium, and Quassia are aqueous extracts prepared by maceration of the drug in *cold* water.

The Alcoholic Extracts (14 in number) are prepared by treating the substance with rectified spirit, proof spirit, or spirit and water, and the subsequent evaporation of the tincture thus prepared. The student should note that there are two semi-solid extracts of belladonna, one a Green or Fresh extract and the other prepared with spirit and known as the Alcoholic extract. Gelsemium extract has also the term Alcoholic affixed.

Belladonna, Indian Hemp, Gelsemium, Jalap, Nux Vomica, and Calabar Bean are made with *rectified* spirit, the percolation being generally finished by displacement with cold water. Hop is also made with *rectified* spirit, and the marc is boiled in water.

Rhubarb, Rhamnus Frangula, Jaborandi, Compound Colocynth, Cascara, and Calumba are made with *proof* spirit, and cold water is also used at the end of the percolating process.

The Ethereal Extract, for there is, strictly speaking, only one—viz., mezereum—is prepared by first making an alcoholic extract, which is next macerated in ether, and the resulting liquid evaporated. Ether is also used in preparing stramonium, which, strictly speaking, is an *alcoholic* extract made with proof spirit after the mere washing of the seeds with ether to remove their oil, the ethereal solution being rejected. Ether is also used in making Male Fern.

Liquid Extracts (15 in number) are either Alcoholic extracts dissolved in spirit and water, or concentrated infusions of drugs, to which enough spirit is added for their preservation. Pareira and Opium are made from their semi-solid extracts.

EXTRACTUM.	MATERIALS USED.	Strength.	DOSE.
<i>Belæ</i> Liq.	Bael fruit, water, and spirit.	1 in 1.	1 to 2 drs.
<i>Cascaræ Sagradæ</i> Liq.	Cascara sagrada, water and spirit.	1 in 1.	$\frac{1}{2}$ to 2 drs.
<i>Cimicifugæ</i> Liq. . . .	Cimicifuga and spirit.	1 in 1.	3 to 30 min.
<i>Cinchonæ</i> Liq. ✓ . . .	Red cinchona bark, hydrochloric acid, glycerine, spirit & water.	1 in 1, or 5 per cent. alkaloids.	5 to 10 min. ✓
<i>Cocæ</i> Liq.	Coca leaves and proof spirit.	1 in 1.	$\frac{1}{2}$ to 2 drs.
<i>Ergotæ</i> Liq.	Ergot, water and spirit	1 in 1.	10 to 30 min.
<i>Filicis</i> Liq.	Male fern (dried rhizome), and ether.	10 yield 1.	15 to 30 min. ✓
<i>Glycyrrhizæ</i> Liq. . . .	Liquorice root, water and spirit.	1 in 2. of extract.	1 dr.
X <i>Hamamelidis</i> Liq. . .	Hamamelis leaves, spirit and water.	1 in 1.	2 to 5 min.
<i>Hydrastis</i> Liq.	Hydrastis rhizome, spirit and water.	1 in 1.	5 to 30 min.
<i>Opii</i> Liq.	Extract of opium, water and spirit.	1 in 20. 22 grs to 1 oz	10 to 40 min.
<i>Pareiræ</i> Liq.	Extract of pareira, water and spirit.	1 in 4. of extract.	$\frac{1}{2}$ to 2 drs.
<i>Rhamni Frangulæ</i> Liq.	Rhamnus frangula bark water and spirit.	1 in 1.	1 to 4 drs. <i>du</i>
<i>Sarsæ</i> Liq.	Jamaica sarsaparilla, proof spirit, sugar and water at 160°.	1 in 1.	2 to 4 drs.
<i>Taraxaci</i> Liq.	Dry dandelion root, proof spirit and water.	1 in 1.	$\frac{1}{4}$ to 2 drs.

Abstracts are alcoholic extracts mixed with sugar of milk, evaporated to dryness and powdered. They are not mentioned in the B.P., but the Dry Extract of *Euonymus* is an abstract.

EXTRACTUM.	SOURCE.	MENSTRUUM USED.	DOSE.
Aconiti	Juice of the fresh leaves and flowering tops.	None.	$\frac{1}{4}$ to 1 gr.
Aloes Barb.	Barbadoes aloes, in fragments.	Boiling water.	2 to 6 grs.
Aloes Socot.	Socotrine aloes, in fragments.	Do.	2 to 6 grs.
Anthemidis	The dried flowers and essential oil.	Do.	2 to 10 grs.
Belladonnæ	Juice of the fresh leaves and young branches.	None.	$\frac{1}{4}$ to 1 gr.
Bellad. Alcohol. ..	Dried belladonna root.	Spirit and water.	$\frac{1}{16}$ to $\frac{1}{4}$ gr.
Calumbæ	The sliced root, dried.	Proof spirit.	2 to 10 grs.
Cannabis Indicæ ..	The dried flowering tops.	Rectified spirit.	$\frac{1}{4}$ to 1 gr.
Cascaræ Sagradæ ..	The powdered bark.	Spirit and water.	2 to 8 grs.
Colchici	Juice of the fresh corms.	None.	$\frac{1}{2}$ to 2 grs.
Colchici Acetic. ..	Do. do.	with acetic acid.	$\frac{1}{2}$ to 2 grs.
Colocynth. Comp. ..	Pulp of colocynth, extract of socotrine aloes, scammony resin, curd soap, and cardamoms.	Proof spirit.	3 to 10 grs.
Conii	Juice of fresh leaves and young branches.	None.	2 to 6 grs.
Euonymi Siccum. ..	The powdered bark.	Spirit, water, and sugar of milk.	1 to 4 grs.
Gelsemii Alcohol. ..	The dried rhizome.	Spirit and water.	$\frac{1}{2}$ to 2 grs.
Gentianæ	The sliced root, dried.	Boiling water.	2 to 10 grs.
Glycyrrhizæ	The dried powdered root.	Cold water.	5 grs. to 1 dr.
Hæmatoxyli	Dried logwood in chips.	Boiling water.	10 to 30 grs.
Hyoscyami	Juice of fresh leaves and branches.	None.	5 to 10 grs.
Jaborandi	The dried leaflets.	Proof spirit and water.	2 to 10 grs.
Jalapæ	The dried powdered root.	Rectified spirit and water.	5 to 15 grs.
Kramerizæ	The dried powdered root.	Cold water.	5 to 20 grs.
Lactucæ	Juice of the flowering herb.	None.	5 to 15 grs.
Lupuli	The dried strobiles.	Rectified spirit and hot water.	5 to 15 grs.
Mezerei Æther. ..	The dried bark cut small.	Rectified spirit and ether.	Externally.
Nucis Vomizæ	The dried seeds, powdered after being steamed.	Rectified spirit and water.	$\frac{1}{4}$ to 1 gr.
Opii	Opium in powder.	Cold water.	$\frac{1}{2}$ to 2 grs.
Papaveris	Dried seedless capsules, powdered.	Boiling water and spirit.	2 to 5 grs.
Pareiræ	The dried powdered root.	Boiling water.	10 to 30 grs.
Physostigmatis ..	The dried powdered bean.	Rectified spirit.	$\frac{1}{16}$ to $\frac{1}{4}$ gr.
Quassizæ	The dried rasped wood.	Cold water.	$\frac{3}{4}$ to 5 grs.
Rhamni Frangulæ ..	The powdered bark.	Proof spirit and water.	15 to 60 grs.
Rhei	The dried powdered root.	Cold water and proof spirit.	5 to 15 grs.
Stramonii	The dried, coarsely powdered seeds.	Ether and proof spirit.	$\frac{1}{4}$ to $\frac{1}{2}$ gr.
Taraxaci	The juice of the fresh root.	None.	5 to 30 grs.

Omit

omit

omit

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omit

X

As regards doses, the student should remember that the extract of Calabar bean and alcoholic extract of belladonna should be given in doses of $\frac{1}{16}$ to $\frac{1}{4}$ gr.; stramonium, $\frac{1}{4}$ to $\frac{1}{2}$ gr.; the green extract of belladonna, nux vomica, aconite, and Indian hemp, $\frac{1}{4}$ to 1 gr.; whilst the doses of colchicum and opium extracts should not exceed 2 grs.

Glycerina (Glycerines—8 in number) are solutions of the drug bearing the name, in glycerine or in glycerine and water.

The fact of the solid constituents being weighed and the fluid ones being measured, leads to difficulties in stating accurately their strengths.

GLYCERINUM.	INGREDIENTS.	Strength by Weight.	Strength by Volume.
Acid. Carbolici..	Carbolic acid and glycerine.	1 in 6.	1 in $4\frac{3}{4}$.
Acid. Gallici ..	Gallic acid and glycerine.	1 in 6.	1 in $4\frac{1}{2}$.
Acid. Tannici ..	Tannic acid and glycerine.	1 in 6.	1 in $4\frac{1}{2}$.
Aluminis	Alum and glycerine.	1 in $7\frac{1}{4}$.	1 in $5\frac{1}{2}$.
Amyli	Starch, glycerine and water.	1 in 10.	1 in 9.
Boracis	Borax, glycerine and water.	1 in 6.	1 in $6\frac{3}{4}$.
Plumbi	Acetate and oxide of lead. Glycerine and water. This latter is afterwards evaporated.	1 in 6.	1 in 4.
Subacetatis ..			
Tragacanthæ ..	Tragacanth, glycerine, and water.	1 in $5\frac{1}{2}$.	1 in $5\frac{3}{4}$.

Infusa (Infusions—28 in number) are watery solutions of vegetable principles prepared without boiling. 24 are prepared by pouring boiling distilled water on the vegetable properly comminuted, and placed in a suitable pot with a covered lid, and allowed to stand a definite short time. Two—Quassia and Calumba—are prepared with cold water, and two—Chiretta and Cusparia—with water at 120° . All will darken on the addition of persalts of iron, except Quassia and Calumba, and all should be prepared fresh. All are directed to be strained except kouss. The product should not be made to measure any particular quantity. The most important infusion for the student to remember is Digitalis. It contains 28 grs. to each 10 oz., at the dose is only two to four drachms. All the infusions are made with 10 oz. water, except kouss, and only 8 oz. are ordered in it; 13 are made with $\frac{1}{2}$ oz. of the vegetable; 8 with $\frac{1}{4}$ oz. linseed has 150 and catechu 160 grs.; gentian and quassia, grs. each; while cascarilla and senna contain 1 oz. each to every 10 oz.

See also B P records at 100°

INFUSIONS.

INFUSUM.	INGREDIENTS.	MENSTRUUM.	TIME.	DOSE.
<i>Con</i> Anthemidis..	$\frac{1}{2}$ oz. flowers.	10 oz. boiling water	$\frac{1}{4}$ hour.	1 to 4 oz.
Aurantii ..	$\frac{1}{2}$ oz. bitter-orange peel cut small.	10 oz. boiling water	$\frac{1}{4}$ hour.	1 to 2 oz.
Aurantii Co.	$\frac{1}{4}$ oz. bitter-orange peel cut small. 56 grs. fresh lemon peel cut small. 28 grs. cloves bruised	10 oz. boiling water	$\frac{1}{4}$ hour.	1 to 2 oz.
<i>u he</i> Buchu ..	$\frac{1}{2}$ oz. leaves bruised.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 4 oz.
<i>me</i> Calumbæ ..	$\frac{1}{2}$ oz. root cut small.	10 oz. <u>cold</u> water.	$\frac{1}{2}$ hour.	1 to 2 oz.
Caryophylli	$\frac{1}{4}$ oz. cloves bruised.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 4 oz.
Cascarillæ <i>X</i>	1 oz. powdered bark.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Catechu ..	160 grs. pale catechu coarsely powdered 30 grs. cinnamon bark bruised.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Chirataë ..	$\frac{1}{4}$ oz. chiretta cut sml.	10 oz. water at <u>120°</u> .	$\frac{1}{2}$ hour.	1 to 2 oz.
Cinch. Acid. ..	$\frac{1}{2}$ oz. red bark in No. 40 powder. 1 dr. aromatic sulphuric acid	10 oz. boiling water	1 hour.	1 to 2 oz.
Cuspariæ ..	$\frac{1}{2}$ oz. bark in No. 40 powder.	10 oz. water at <u>120°</u>	1 hour.	1 to 2 oz.
Cusso ..	$\frac{1}{2}$ oz. kousso coarsely powdered.	8 oz. boiling water.	$\frac{1}{4}$ hour.	4 to 8 oz.
<i>X</i> Digitalis ..	28 grs. dried leaves.	10 oz. boiling water	$\frac{1}{4}$ hour.	2 to 4 drs.
Ergotæ ..	$\frac{1}{4}$ oz. coarsely powdered.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Gentianæ Co.	55 grs. root sliced, 55 grs. bitter-orange peel cut. $\frac{1}{4}$ oz. fresh lemon peel cut.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Jaborandi ..	$\frac{1}{2}$ oz. dried leaflets.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Krameriaë ..	$\frac{1}{2}$ oz. root powdered.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
<i>X</i> Lini ..	150 grs. of the seeds, 50 grs. dried liquorice root in No. 20 powder	10 oz. boiling water	2 hours.	2 to 6 oz.
Lupuli ..	$\frac{1}{2}$ oz. dried strobiles.	10 oz. boiling water	1 hour.	1 to 2 oz.
Maticæ ..	$\frac{1}{2}$ oz. leaves cut small.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 4 oz.
Quassiaë ..	55 grs. wood chips.	10 oz. <u>cold</u> water.	$\frac{1}{2}$ hour.	1 to 2 oz.
Rhei ..	$\frac{1}{4}$ oz. root in thin slices.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Rosæ Acidum	$\frac{1}{4}$ oz. dried red rose petals. 1 dr. dilute sulphuric acid.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Senegæ ..	$\frac{1}{2}$ oz. root powdered.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Sennæ <i>X</i> ..	1 oz. senna & 28 grs. ginger sliced.	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Serpentariæ	$\frac{1}{4}$ oz. rhizome powd'rd	10 oz. boiling water	$\frac{1}{2}$ hour.	1 to 2 oz.
Uvæ Ursi ..	$\frac{1}{2}$ oz. leaves bruised.	10 oz. boiling water	1 hour.	1 to 2 oz.
Valerianaë ..	$\frac{1}{4}$ oz. rhizome bruised	10 oz. boiling water	1 hour.	1 to 2 oz.

*bucc**Rutace
Menis
Myrtac
Euphorb
cinchon
bucc**gentian**Rutace**Rosace**Scrophula**bucc**bucc**bucc**bucc*

There are 7 Infusions which are really compound preparations, containing more than one ingredient; they are—Aurantii Co., Catechu, Cinchonæ Acid., Gentianæ Co., Lini, Rosæ Acid., and Sennæ, though the student will note that the title compound is only conferred upon two of them—viz., Gentian and Orange. The new Pharmacopœia, in addition to shortening the time for the majority of the infusions, has reduced the strength of Digitalis from 3 grs. to 2·8 grs. per oz., and has also added acid to cinchona. and given more minute directions for the comminution of the substances previous to infusion.

Injectio Hypodermica—There are 3 preparations under this head in the Pharmacopœia.

1 10. 5 33
ACME.

HYPODERMIC INJECTIONS.

Q cocaine. C. hydr. 33 grs. 2 5 mins.

INJECTIO HYPODERMICA.	COMPOSITION.	STRENGTH.	DOSE.
Apomorphinæ	Hydrochlorate of apomorphine, 2 grs.; camphor water, 100 minims.	1 in 50.	2 to 8 mins.
Ergotini ..	Ergotin, 100 grs.; camphor water 200 grs.	1 to 2.	3 to 10 mins.
Morphinæ ..	Hydrochlorate of morphine, 92 grs.; solution of ammonia, acetic acid; and water, q. s. to 2 ozs.	1 gr. acetate in 10 mins.	Commencing with from 1 to 2 mins.

ACME.

Lamellæ (Discs) are 3 in number—

Lamellæ Atropinæ—Discs of gelatine and some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{5000}$ gr. sulphate of atropine.

Lamellæ Cocainæ—Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{200}$ gr. hydrochlorate of cocaine.

Lamellæ Physostigminæ—Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine.

Linimenta (Liniments or Embrocations—16 in number) are preparations for external application to the skin, and intended to be applied with friction. They are really very thin ointments, though the majority of them are perfectly limpid liquids. The iodide of potassium with soap liniment, is a soft solid—like shaving paste. Of the 16, all contain either a fixed or volatile oil or a soap, except Lin. Iodi, camphor entering into 11 of them. Those without camphor are ammonia, lime, iodine, croton oil, and iodide of potassium with soap.

pl. ca.

4. Sulph. atropine.
Potass. permang. 3 of trinitrin
with Strychnine Hydr. + trinitrin
the 1% before can be seen -

LINIMENTS.

LINIMENTUM.	COMPOSITION.	STRENGTH.
Aconiti	20 oz. root, 1 oz. camphor, and 30 oz. rectified spirit.	1 in 1½.
Ammoniaë ..	1 oz. solution of ammonia, and 3 oz. olive oil.	1 in 4.
Belladonnæ ..	20 oz. root, 1 oz. camphor, and 30 oz. rectified spirit.	1 in 1½.
Calcis	2 oz. lime water, and 2 oz. olive oil, agitated together.	1 in 2.
Camphoræ ..	1 oz. camphor and 4 oz. olive oil.	1 in 5.
Camphoræ Co.	2½ oz. camphor, 1 dr. oil of lavender, 5 oz. strong solution of ammonia, and 15 oz. rectified spirit.	1 in 9.
Chloroformi ..	2 oz. chloroform, and 2 oz. camphor liniment.	1 in 2.
Crotonis	1 oz. croton oil, and 3½ oz. each oil of cajuput and rectified spirit.	1 in 8.
Hydrargyri ..	1 oz. each of mercurial ointment, solution of ammonia, and liniment of camphor, rubbed together.	1 of oint. in 3, or 1 of Hg. in 6.
Iodi	1½ oz. iodine, ½ oz. iodide of potassium, ¼ oz. glycerine, 10 oz. rectified spirit.	1 in 9.
Opii	2 oz. tincture of opium, and 2 oz. soap liniment.	1 in 2.
Potassii Iodidi cum Sapone	2 oz. curd soap, 1½ oz. iodide of potassium, 1 oz. glycerine, 1 dr. oil of lemon, and 10 oz. distilled water.	54½ grs. in 1 fl. oz. or 1 in 10 by weight.
Saponis	2 oz. hard soap, 1 oz. camphor, 3 drs. oil of rosemary, 4 oz. distilled water, and 16 oz. rectified spirit.	1 in 12.
Sinapis Co. ..	1 dr. oil of mustard, 40 grs. ethereal extract of mezereon, 120 grs. camphor, 5 drs. castor oil, and 4 oz. rectified spirit.	1 in 40.
Terebinthinæ	2 oz. soft soap, 1 oz. camphor, 16 oz. oil of turpentine, and 2 oz. water.	4 in 5.
Terebinth. Acet.	4 oz. oil of turpentine, 1 oz. glacial acetic acid, 4 oz. camphor liniment.	4 in 9.

Liquores (Solutions—51 in number) are solutions of vegetable principles or inorganic substances, mostly in distilled water. One—**Epispasticus**—comes from the animal kingdom, and is made with acetic ether. **Antim. chlorid.** is made with hydrochloric acid, gutta percha with chloroform, ethylate of sodium and trinitrin with alcohol, and atropine sulph. with camphor water.

The following 11 are all of the same strength—I in 100; they are most important preparations:—

Arsenicalis.	Atropinæ Sulph.	Pot. Permang.
Arsenici Hydr.	Morphinæ Sulph.	Strychninæ Hydr.
Arsenii et Hyd. Iod.	Morphinæ Hydr.	Trinitrini.
Sodii Arsen.	Morphinæ Acet.	

LIQUORS OR SOLUTIONS.

LIQUOR.	STRENGTH.	DOSE.
Acid. Chromici.. .. .	25 p. cent. anhydrous.	Used externally.
Ammoniaë	1 in 3. (10 per cent.)	10 to 30 m.
Ammoniaë Fortior	32·5 per cent.	Used externally.
Ammonii Acetatis	1 in 5.	2 to 6 drs.
Ammonii Acet. Fortior.	about 30 per cent.	25 to 75 m.
Ammonii Cit. Fortior	68 per cent.	$\frac{1}{2}$ to $1\frac{1}{2}$ drs.
Ammonii Citratis	1 in 4.	2 to 6 drs.
Antimonii Chloridi	36 per cent.	Used externally.
Arsenicalis	1 in 100.	2 to 8 m.
Arsenici Hydrochloricus	1 in 100.	2 to 8 m.
Arsenii et Hydr. Iod.	1 in 100.	10 to 30 m.
Atropinæ Sulphatis	1 in 100.	1 to 4 m.
Bismuthi et Ammon. Cit.	3 grs. in 1 dr.	$\frac{1}{2}$ to 1 dr.
Calcii Chloridi	1 in 6.	15 to 50 m.
Calcis	$\frac{1}{2}$ gr. in 1 oz.	1 to 4 oz.
Calcis Chlorinataë	2 to 3 per cent. Cl.	10 to 20 m.
Calcis Saccharatus	7 grs. in 1 oz.	15 to 60 m.
Chlori	2·6 grs. in 1 oz.	10 to 20 m.
Cocainæ Hydrochloratis	1 in 10.	2 to 10 m.
Epispasticus	1 in 4.	Used externally.
Ferri Acetatis	1 in 4.	5 to 30 m.
" Acet. Fort.	40 per cent.	1 to 8 m.
" Dialysatus	5 per cent.	10 to 30 m.
" Perchloridi	1 in 4.	10 to 30 m.
" " Fortior	1 oz. iron in 5.	2 to 8 m.
" Pernitratis	1 oz. iron in 30.	10 to 40 m.
" Persulphatis	36 per cent.	—
Gutta Percha	1 in 9.	Used externally.
Hydrargyri Nit. Acidus	48 per cent.	Used externally.
Hydrargyri Perchloridi	$\frac{1}{2}$ gr. in 1 oz.	$\frac{1}{2}$ to 2 drs.
Iodi	22 grs. in 1 oz.	5 to 10 m.
Lithiæ Effervescens	10 grs. in 1 pint.	5 to 10 oz.
Magnesii Carbonatis	10 grs. in 1 oz.	1 to 2 oz.
Magnesii Citratis	3 $\frac{1}{2}$ per cent.	5 to 10 oz.
Morphinæ Acetatis	1 in 100.	10 to 60 m.
Morphinæ Bimeconatis	1 $\frac{1}{4}$ in 100.	5 to 40 m.
Morphinæ Hydrochloratis.	1 in 100.	10 to 60 m.
Morphinæ Sulphatis	1 in 100.	10 to 60 m.
Plumbi Subacetatis	24 per cent.	$\frac{1}{2}$ to 2 m.
" " Dilutus	1 in 80.	$\frac{1}{2}$ to 2 drs.
Potassæ	27 grs. in 1 oz.	15 to 60 m.
Potassæ Effervescens	30 grs. in 1 pint.	5 to 10 oz.
Potassii Permanganatis	1 in 100.	2 to 4 drs.
Sodæ	18·8 grs. in 1 oz.	15 to 60 m.
Sodæ Chlorinataë	2 $\frac{1}{2}$ per cent. Cl.	10 to 20 m.
Sodæ Effervescens	30 grs. in 1 pint.	5 to 10 oz.
Sodii Arseniatis	1 in 100.	5 to 10 m.
Sodii Ethylatis	19 per cent.	Used externally.
Strychninæ Hydrochloratis	1 in 100.	5 to 10 m.
Trinitrini	1 in 100.	$\frac{1}{2}$ to 2 m.
Zinci Chloridi	46 grs. in 1 dr.	Used externally.

Lotiones (Lotions—2 in number) are liquid preparations for external application.

Lotio Hydrargyri Flava, 18 grs. hyd. perchlor. and 10 ozs. lime water.

Lotio Hydrargyri Nigra, 30 grs. calomel and 10 ozs. lime water.

Mella (Honeys—5 in number), are preparations of honey.

Mel—A saccharine secretion from *Apis Mellifica*.

Mel Depuratum—Honey melted and strained through flannel.

Mel Boracis—60 grs. powdered borax mixed with 480 grs. honey, and 30 grs. glycerine.

Oxymel—40 ozs. honey, 5 ozs. acetic acid, and 5 ozs. distilled water.

Oxymel Scillæ—1 pint vinegar of squill and 2 lbs. honey.

Misturæ—(Mixtures—11 in number).

MISTURA.	COMPOSITION.	STRENGTH PER OZ.
Ammoniaci ..	$\frac{1}{4}$ oz. ammoniacum rubbed up with 8 oz. water, and strained.	13 $\frac{1}{2}$ grs.
Amygdalæ ..	2 oz. compound powder of almonds and 16 ozs. water, and strained.	54 grs.
Creasoti ..	15 minims each creasote and glacial acetic acid, 1 oz. syrup, $\frac{1}{2}$ dr. spirit of juniper, and 15 oz. water.	1 minim.
Cretæ	$\frac{1}{4}$ oz. prepared chalk, $\frac{1}{4}$ oz. gum acacia in powder, $\frac{1}{2}$ oz. syrup, and 7 $\frac{1}{2}$ oz. cinnamon water.	13 $\frac{1}{2}$ grs.
Ferri Aromatica	1 oz. red bark, $\frac{1}{2}$ oz. calumba root, $\frac{1}{4}$ oz. cloves, $\frac{1}{2}$ oz. iron wire, 3 oz. compound tincture of cardamoms, $\frac{1}{2}$ oz. tincture of orange peel, and peppermint water to 16 oz.	about $\frac{1}{20}$ gr.
Ferri Comp. ..	25 grs. sulphate of iron, 30 grs. carbonate of potassium, 60 grs. myrrh, 60 grs. sugar, 4 drs. spirit of nutmeg, 9 $\frac{1}{2}$ oz. rose water.	2 $\frac{1}{2}$ grs.
Guaiaci ..	$\frac{1}{2}$ oz. guaiacum resin, $\frac{1}{2}$ oz. sugar, $\frac{1}{4}$ oz. gum acacia powdered, and 1 pt. cinnamon water.	11 grs.
Olei Ricini .	6 drs. castor oil, 10 mins. oil of lemon, 2 mins. oil of cloves, 1 $\frac{1}{2}$ dr. syrup, 1 dr. solution of potash, orange flower water to 2 oz.	3 drs.
Scammonii ..	6 grs. scammony in 2 oz. milk.	3 grs.
Sennæ Co. ..	4 oz. sulphate of magnesium, 1 oz. liq. extract of liquorice, 2 $\frac{1}{2}$ oz. tincture of senna, 1 $\frac{1}{2}$ oz. compound tincture of cardamoms, 15 oz. infusion of senna.	1 dr. tinct. and 87 grs. mag. sulph.
Spt. Vini Gallici.	4 oz. brandy, 4 oz. cinnamon water, the yolks of 2 eggs, $\frac{1}{2}$ oz. sugar.	3 drs.

1 in 8

Griffiths
Sennæ

Black
senna

The formula of each of the official mixtures may be regarded as a carefully written recipe in which a mixture is ordered, the ingredients being mostly in suspension. The dose may be said to be the same for all—from $\frac{1}{2}$ to 1 or 2 oz.

Mucilagines (Mucilages—3 in number) should be, strictly speaking, watery solutions of a gum, but in mucilage of starch the starch is not dissolved.

Mucilago Acaciæ—4 oz. gum acacia dissolved in 6 oz. distilled water.

Mucilago Amyli—120 grs. starch boiled in 10 oz. distilled water. *omit*

Mucilago Tragacanthæ—60 grs. of the powdered gum mixed with 2 drs. rectified spirit and 10 oz. distilled water added.

Oleata (Oleates—2 in number).

Oleatum Hydrargyri—1 oz. yellow oxide of mercury and 9 oz. oleic acid.

Oleatum Zinci—1 oz. oxide of zinc and 9 oz. oleic acid. *omit*

Olea (Oils).—Under this name there are 35 substances in the Pharmacopœia. They may be divided into two well-marked classes—fixed and volatile—the fixed being obtained by expression, and the volatile being products of distillation, except in the case of *Ol. Limonis*, a vegetable oil, which is volatile though obtained by expression. In addition to these, which are only known as oils, there are others equally deserving the name, as camphor, which is a volatile oil; lard, wool fat, wax, suet, and spermaceti, which are fixed.

Of the 35 oils, one is an animal product—cod liver oil—which is a fixed oil, and, omitting lemon, seven are expressed—Almond, Croton, Linseed, Nutmeg (concrete), Olive, Castor, and Theobroma; Cade is obtained by *destructive* distillation. Two are semi-solid—viz., Theobroma and Concrete Oil of Nutmeg.

As a rule, they vary from colourlessness through straw and yellow to a pale brown, but cajuput is a deep green colour and cade is nearly black.

Cloves, cinnamon, pimento and mustard oils *sink* in water.

The dose of each of the volatile oils is, speaking generally about 1 to 4 minims. The oil of mustard is a powerful poison and should only be used externally. Of the fixed oils, croton is only given in doses of $\frac{1}{3}$ to 1 minim, while of the remaining six nearly an ounce each may be given.

The volatile oils are added to the official pill masses for two reasons—to correct griping, and to serve as a means of distinguishing the various pill masses from each other by their odour.

Oleo-Resina.—There is one preparation of this class—Oleo-Resina Cubebæ—prepared by allowing an ethereal tincture of Cubebs to evaporate. *omit*

Black in decaying alluvium turning their roots with cast olive leaves

OLEUM.	SOURCE AND HOW PREPARED.	DOSE.
Amygdalæ ..	Expressed from bitter or sweet almonds.	2 to 4 drs.
Anethi	Distilled in Britain from dill fruit.	1 to 4 mins.
Anisi	Distilled in Europe and China from the fruit of Anise and Star-anise.	1 to 4 mins.
Anthemidis ..	Distilled in Britain from the flowers.	1 to 4 mins.
Cadinum	Obtained by the <i>destructive</i> distillation of the wood of juniperus oxycedrus and other species.	Used externally.
Cajuputi	Distilled from the leaves.	1 to 4 mins.
Carui	Distilled in Britain from the fruit.	1 to 4 mins.
Caryophylli ..	Distilled in Britain from the flower buds.	1 to 4 mins.
Cinnamomi ..	Distilled from cinnamon bark.	1 to 4 mins.
Copaibæ	Distilled from the oleo-resin.	5 to 20 mins.
Coriandri ..	Distilled in Britain from the fruit.	1 to 4 mins.
Crotonis	Expressed in Britain from the seeds.	$\frac{1}{2}$ to 1 min.
Cubebæ	Distilled in Britain from the unripe fruit.	5 to 20 mins. <i>W.B.</i>
Eucalypti ..	Distilled from the fresh leaves.	1 to 4 mins.
Juniperi	Distilled in Britain from the unripe fruit.	1 to 4 mins.
Lavandulæ ..	Distilled in Britain from the flowers.	1 to 4 mins.
Limonis	Expressed from the fresh peel.	1 to 4 mins.
Lini	Expressed in Britain without heat from the seeds.	Used externally.
Menthæ Pip- ritæ	Distilled in Britain from the fresh flowering herb.	1 to 4 mins.
Menthæ Viridis	Distilled in Britain from the fresh flowering herb.	1 to 4 mins.
Morrhuae	Extracted by a heat under 180° from the fresh liver.	1 to 8 drs.
Myristicæ ..	Distilled in Britain from the dried seeds.	1 to 4 mins.
Myristicæ Ex- pressum ..	Expressed with aid of heat from do.	Not given. <i>L</i>
Olivæ	Expressed from the ripe fruit.	$\frac{1}{2}$ to 1 oz.
Phosphoratum	Expressed oil of almonds and phosphorus, heated to 180°.	5 to 10 mins.
Pimentæ	Distilled in Britain from the unripe berry.	1 to 4 mins.
Pini Sylvestris	Distilled from the fresh leaves.	—
Ricini	Expressed from the seeds.	1 to 8 drs.
Rosmarini ..	Distilled from the flowering tops.	1 to 4 mins.
Rutæ	Distilled from the fresh herb.	1 to 4 mins.
Sabinæ	Distilled in Britain from fresh tops.	1 to 4 mins.
Santali	Distilled from the wood.	10 to 30 mins.
Sinapis	Distilled with water from the black seeds, after the removal of the fixed oil by expression.	Used externally. <i>L</i>
Terebinthinæ ..	Distilled from the oleo-resin.	10 mins. to 4 drs.
Theobromatis ..	Expressed with heat from the ground seeds.	Not given.

*In Pil. col. 60
These Scammony th
h. 800 r 1000 g. each
water root of these these mix
& the strength one pto is 1 in 6*

Pilulæ (Pills—22 in number) are soft solid masses, capable of being easily made into little globular forms. More than the half of them are purgative, and the dose is generally 5 to 10 grs. The dose of Pil. Phosphori is only 2 to 4 grs., and of Pil. Ferri 1 to 4 pills of 5 grs. each.

PILULA.	INGREDIENTS.	STRENGTH.
Aloes Barbadosensis	Barbadoes aloes, hard soap, oil of caraway, and confection of roses.	1 in 2.
Aloes et Asafoet.	Socotrine aloes, asafoetida, hard soap, and confection of roses.	1 in 4.
Aloes et Ferri. . .	Sulphate of iron, Barbadoes aloes, compound powder of cinnamon, and confection of roses.	1 in 7. <i>1-5 6</i>
<i>Refine Pill</i> Aloes et Myrrhæ	Socotrine aloes, myrrh, saffron, treacle and glycerine.	1 in 3.
Aloes Socotrinæ	Socotrine aloes, hard soap, volatile oil of nutmeg, and confection of roses.	1 in 2.
Asafoetidæ Co. . .	Asafoetida, galbanum, myrrh, and treacle.	1 in 3½.
Cambogiæ Co. . .	Gamboge, Barbadoes aloes, hard soap, compound powder of cinnamon, and syrup.	1 in 6.
Colocynth. Co. . .	Colocynth, Barbadoes aloes, scammony resin, sulphate of potassium, oil of cloves, and water.	1 in 6.
Colocynth. et Hyoscyami. . .	Compound colocynth pill and extract of hyoscyamus.	2 & 1, in 3.
<i>omit</i> Conii Co.	Extract of hemlock, ipecac., and treacle.	2½ in 3.
Ferri	Sulphate of iron, carbonate of potassium, sugar, tragacanth, glycerine and water.	1 in 5.
<i>omit</i> Ferri Carb.	Saccharated carbonate of iron and confection of roses.	1 in 1¼.
<i>omit</i> Ferri Iodidi. . . .	Iron wire, iodine, sugar, powdered liquorice, and distilled water.	1 in 3½.
<i>Blue P.</i> Hydrargyri	Mercury, confection of roses, and powdered liquorice.	1 in 3.
Hydrarg. Subchlor. Co. . .	Calomel, sulphurated antimony, guaiacum resin, and castor oil.	1 in 5.
Ipecacuanhæ C. Scilla	Dover's powder, squill, ammoniacum, and treacle.	1 in 23.
Plumbi C. Opio . . .	Acetate of lead, opium, and confection of roses.	6 & 1, in 8.
Phosphori	Phosphorus, balsam of tolu, yellow wax, and curd soap.	1 in 90.
Rhei Co.	Rhubarb, Socotrine aloes, myrrh, hard soap, oil of peppermint, treacle, and glycerine.	1 in 4¼.
Saponis Co.	Opium, hard soap, and glycerine.	1 in 6. (of opium.)
Scammonii Co. . . .	Resins of scammony and jalap, curd soap, strong tincture of ginger, and rectified spirit.	1 in 3¼.
Scillæ Co.	Squill, ginger, ammoniacum, hard soap, and treacle.	1 in 5.

Nearly all the pill masses are dark brown or black in colour, only a few can be distinguished by sight—thus Pil. Hydrarg. is *blue*; Hyd. Subchlor. Co. a *bright orange*; and Conii *dark green*. The majority are distinguishable by smell—thus, Colocynth is known by its odour of cloves; Barbadoes aloes, by its caraway; Socotrine aloes, by its nutmeg; Rufus' pill, by its saffron; Aloes et Asafoetidæ, by its powerful fetid odour; whilst in Pil. Asafoetidæ Co., the myrrh almost conceals the stinking gum; Pil. Cambogiæ smells strongly of Barbadoes aloes, and is not of the yellow colour which the student might expect; Pil. Scillæ Co. is known by the odour of its ammoniacum; Saponis, by its tawny colour and opium smell; Rhubarb, by its peppermint; and Lead and Opium, by the odour of acetic acid.

Pulveres (Powders) are 16 in number:—

PULVIS.	INGREDIENTS.	DOSE IN GRAINS.	STRENGTH.
Amygdalæ Co. . . .	Sweet almonds, refined sugar, and acacia gum.	10 to 60.	8 in 13.
Antimonialis . . .	Oxide of antimony and phosphate of calcium.	3 to 5.	1 in 3.
Catechu Co. . . .	Catechu, kino, rhatany, cinnamon, and nutmeg.	20 to 40.	1 in 2½.
Cinnamomi Co... .	Cinnamon, cardamoms, and ginger.	3 to 10.	1 in 3.
Cretæ Aromaticus . .	Cinnamon, nutmeg, saffron, cloves, cardamoms, sugar, and chalk.	10 to 60.	1 in 4½.
Cretæ Aromat. C. Opio	Aromatic chalk powder, and opium.	10 to 40.	1 in 40. (opium.)
Elaterini Co. . . .	Elaterin and sugar of milk.	½ to 5.	1 in 40.
Glycyrrhizæ Co. . .	Senna, liquorice root, sugar, fennel fruit and sulphur.	30 to 60.	1 in 6
Ipecacuanhæ Co. . .	Ipecacuanha, opium, and sulphate of potassium.	5 to 15.	1 in 10.
Jalapæ Co.	Jalap, cream of tartar, and ginger.	20 to 60.	1 in 3.
Kino Co...	Kino, opium, and cinnamon.	5 to 20.	1 in 20 (opium.)
Opii Co...	Opium, black pepper, ginger, caraway, and tragacanth.	2 to 5.	1 in 10.
Rhei Co...	Rhubarb, light magnesia, and ginger.	20 to 60.	1 in 4½.
Scammonii Co. . . .	Scammony resin, jalap, and ginger.	10 to 20.	1 in 2.
Sodæ Tart. Efferves.	Tartarated soda 120 grs., bicarbonate of soda 40 grs., and 38 grs. tartaric acid in a separate paper.	198.	120, 40, and 38.
Tragacanthæ Co. . .	Tragacanth, gum acacia, starch, and sugar.	20 to 60.	1 in 6.

The official powders are all called "compound" except four—Antimonial, Aromatic Chalk, Aromatic Chalk with Opium, and Seidlitz Powder. They can be for the most part distinguished by their colour, which is given, with the exact weight of each constituent under the name of the drug, in the *Materia Medica*. The student cannot, however, depend upon colour *alone*, as cinnamon, aromatic chalk, aromatic chalk with opium, ipecacuanha, jalap, rhubarb, and scammony closely resemble each other, only differing by very faint gradations of colour. The smell, along with the colour, will distinguish most of them—thus, the odour of opium distinguishes the aromatic chalk and opium powder from the plain aromatic chalk.

Spiritus (Spirits—of which there are 18 in number) are for the most part alcoholic solutions of a volatile oil. The student should remember that all are colourless when freshly prepared except brandy.

SPIRITUS.	COMPOSITION.	STRENGTH.	DOSE.
Ætheris	Ether and spirit.	1 in 3.	$\frac{1}{2}$ to $1\frac{1}{2}$ drs.
Ætheris Compositus (<i>Hoffmann's Anodyne</i> .)	Ethereal oil, ether, and spirit.	1 in 64.	$\frac{1}{2}$ to 2 drs.
Ætheris Nitrosi ..	A spirituous solution of nitrous compounds.	S. G. ·840–·845.	$\frac{1}{2}$ to 2 drs.
Ammoniæ Aromat.	Carbonate, strong solution of ammonia, v. oil of nutmeg, oil of lemon, spirit and water.	1 in 40. (Carbonate). 1 in 20. (Liq. Am. F.)	$\frac{1}{2}$ to 1 dr.
Ammoniæ Fœtidus ..	Asafœtida, strong solution of ammonia, and spirit.	$1\frac{1}{2}$ in 20.	$\frac{1}{2}$ to 1 dr.
Armoraciæ Compos.	Horseradish root, bitter orange peel, nutmeg, proof spirit, and water.	1 in 8.	1 to 2 drs.
Cajuputi	Oil of cajuput and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Camphoræ	Camphor and spirit.	1 in 10.	10 to 30 m.
Chloroformi	Chloroform and spirit.	1 in 20.	20 to 60 m.
Cinnamomi	Oil of cinnamon and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Juniperi	Oil of juniper and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Lavandulæ	Oil of lavender and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Menthæ Piperitæ ..	Oil of peppermint and spirit	1 in 50.	$\frac{1}{2}$ to 1 dr.
Myristicæ	Volatile oil of nutmeg and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Rectificatus	Alcohol, with 16 per cent. of water.	56 O.P.	—
Rosmarini	Oil of rosemary and spirit.	1 in 50.	$\frac{1}{2}$ to 1 dr.
Tenuior	Spirit 5 pints and water 3 pints.	49 p. cent.	—
Vini Gallici	Spirit distilled from French wine.	About do.	—

Succi (Juices—7 in number).—Two are introduced to make the syrups of the same name, viz.—**Succus Mori** and **Succus Limonis**. They are the juices of the fruits.

The remaining five, which are regarded as the juices proper, are prepared by adding 1 measure of rectified spirit to 3 measures of the freshly expressed juice of the recently collected plants.

SUCCUS.	SOURCE.	DOSE.
Belladonnæ	Fresh leaves and young branches after flowering.	5 to 15 mins.
Conii	Fresh leaves and young branches when the fruit begins to form.	$\frac{1}{2}$ to 1 dr.
Hyoscyami	Fresh leaves, flowering tops and young branches.	$\frac{1}{2}$ to 1 dr.
Scoparii	Fresh tops.	1 to 2 drs.
Taraxaci	Fresh root gathered in autumn.	1 to 2 drs.

Suppositoria (Suppositories—9 in number), are small, solid masses, weighing about 15 grs. and of conical shape, containing some active ingredient blended with a fatty, gelatine, or soapy basis for introduction into the rectum. The glycerine suppository is made to weigh 30, 60, or 120 grs. each.

SUPPOSITORIA.	INGREDIENTS.	STRENGTH.
		GRS. IN EACH.
Acidi Carbolici cum Sapone	Carbolic acid, curd soap, and glycerine of starch.	1 gr.
Acidi Tannici	Tannic acid and oil of theobroma.	3 grs.
Acidi Tannici cum Sapone	Tannic acid, glycerine of starch, curd soap, and starch.	3 grs.
Glycerini	Gelatine, Glycerine, and water.	70 per cent.
Hydrargyri	Ointment of mercury and oil of theobroma.	5 grs. (ungt.)
Iodoformi	Iodoform and oil of theobroma.	3 grs.
Morphinæ	Hydrochlorate of morphine and oil of theobroma.	$\frac{1}{2}$ gr.
Morphinæ c. Sapone	Hydrochlorate of morphine, glycerine of starch, curd soap, and starch.	$\frac{1}{2}$ gr.
Plumbi Co.	<u>Acetate of lead, opium, and oil of theobroma.</u>	3 grs. and 1 gr. opium.

Syrupi (Syrups—18 in number) are strong solutions of sugar, each charged with some preparation either to preserve it or make its administration more agreeable. 14 are of vegetable origin. They are mostly—the S.G. being generally about 1·33— $\frac{1}{3}$ heavier than water, and loaf sugar only is used in their preparation, and the water that enters into their composition is to be distilled; the dose averages 1 drachm.

The syrups are recognised by their colour, with which the student should be familiar. Syrup, syrup of orange flowers, tolu, chloral, iodide, and phosphate of iron are *colourless*. Syrups of squill, lemon, orange peel, and ginger, are straw-coloured; the last two being somewhat muddy. Syrups of rhubarb, hemidesmus, and poppies, are brown, whilst syrup of senna is a dark coffee-brown. Mulberry syrup is a rich, deep, lake colour, and hence its use to give an agreeable colour to mixtures. Syrups of red poppy, and red rose, are of brilliant shades of red.

SYRUPS.

SYRUPUS.	INGREDIENTS.	STRENGTH (by volume.)
Syrupus	Sugar, 5 lbs., water 2 $\frac{1}{2}$ lbs.	1 in 1 $\frac{1}{8}$.
Aurantii .. .	Syrup and tincture of orange peel.	1 in 8.
Aurantii Floris ..	Orange flower water, sugar, and water.	1 in 6 $\frac{3}{4}$.
Chloral	Hydrate of chloral, syrup and water.	1 in 6.
Ferri Iodidi	Iron wire, iodine, sugar and water, each drachm contains 4·3 grains.	1 in 14.
Ferri Phosph. ..	Granulated sulphate of iron, bicarbonate and phosphate of sodium, concentrated phosphoric acid, sugar and water; 1 gr. in each drachm.	1 in 60.
Ferri Subchlor. ...	Iron wire, hydrochloric acid, citric acid, water and syrup.	1 in 16.
Hemidesmi	Hemidesmus root, sugar and water.	1 in 8.
Limonis	Fresh lemon peel, juice and sugar.	1 in 2.
Mori	Mulberry juice, sugar and rectified spirit.	1 in 2.
Papaveris	Seedless capsules, rectified spirit, sugar and water.	1 in 2 $\frac{1}{6}$.
Rhei	Rhubarb root, coriander fruit, sugar, rectified spirit and water.	1 in 15.
Rhœados	Fresh red poppy petals, sugar, water and rectified spirit.	1 in 3 $\frac{1}{2}$.
Rosæ Gallicæ ..	Dried red rose petals, sugar and water.	1 in 17.
Scillæ	Vinegar of squill and sugar.	1 in 17. (of squill.)
Sennæ	Senna leaves, oil of coriander, sugar, water and rectified spirit.	1 in 2.
Tolutanus	Balsam of tolu, sugar and water.	1 in 29.
Zingiberis	Strong tincture of ginger and syrup.	1 in 26.

Tabellæ (Tablets—only one preparation is official).

Tabellæ Nitroglycerini—Tablets of chocolate each weighing $2\frac{1}{2}$ grs. and containing $\frac{1}{100}$ gr. pure nitroglycerine.

Tincturæ (Tinctures—75 in number) are alcoholic solutions, chiefly of vegetable substances, though two are from the animal kingdom—viz., cochineal and Spanish fly. Four are from the inorganic world—viz., perchloride of iron, acetate of iron, iodine, and chloroform, the remaining 69 being of vegetable origin. The most of the substances are ordered to be comminuted or powdered, macerated for 48 hours in $\frac{3}{4}$ of the spirit, then packed in a percolator, and when the fluid ceases to pass, the process is continued with the remaining $\frac{1}{4}$ of the spirit. The contents of the percolator are then subjected to pressure, the product filtered, mixed with the first liquid, and made up to the original bulk of the spirit employed.

44 tinctures are made in this mixed method of maceration and percolation.

19 are made by simple maceration, generally for seven days.

1 only (strong tincture of ginger) is made by pure percolation.

1 (tincture of strophanthus) is made by a process of very slow percolation—viz., by macerating the dry powdered drug after it has been packed in the percolator.

10 are made by simple solution or mixing.

In the majority, proof spirit (5 spirit and 3 of water) is used, but when an oily or resinous substance is to be operated upon, strong spirit is employed.

43 tinctures are made with proof spirit.

23 are made with rectified spirit.

4 with varying proportions of spirit and water.

2 are prepared with sal volatile (Guaiacum and Valerian).

1 with spirit of ether (Ethereal Tincture of Lobelia).

1 with tincture of orange peel (Tincture of Quinine).

1 mainly with syrup (Tincture of Chloroform and Morphine).

Ether is used for the removal of the resinous and fatty matters in the making of the tincture of strophanthus, but the superfluous ether is driven off by drying.

$2\frac{1}{2}$ ozs. to the pint—that is, one part in 8, or $54\frac{1}{2}$ grs. in 1 oz., is the most common strength, since there are 37 tinctures so prepared.

58 tinctures consist of one ingredient and the solvent—"Simple Tinctures."

7 tinctures are called compound—"Compound Tinctures."

10 tinctures, though not *called* compound, contain more than one ingredient and the solvent—"Complex Tinctures."

TINCTURA.	INGREDIENTS IN 1 PINT.	STRENGTH.	DOSE.
Aconiti	2½ oz. root, rectified spirit.	1 in 8	5 to 15 m.
Arnica	1 oz. rhizome, rectified „	1 in 20	½ to 1 dr.
Asafoetida	2½ oz. gum, rectified „	1 in 8	½ to 1 dr.
Aurantii	2 oz. dried peel, proof „	1 in 10	1 to 2 drs.
Aurant. Rec.	6 oz. fresh peel, rectified „	1 in 3½	1 to 2 drs.
Belladonna	1 oz. leaves, proof „	1 in 20	5 to 20 mins.
Buchu.	2½ oz. leaves, proof „	1 in 8	1 to 2 drs.
Calumbæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Cannab. Ind.	1 oz. extract, rectified „	1 in 20	5 to 20 mins.
Cantharidis	¼ oz. flies, proof „	1 in 80	5 to 20 mins.
Capsici	¾ oz. fruit, rectified „	1 in 27	10 to 20 mins.
Cascarilla	2½ oz. bark, proof „	1 in 8	½ to 2 drs.
Chirata	2½ oz. herb, proof „	1 in 8	½ to 2 drs.
Cimicifuga	2½ ozs. rhizome, proof „	1 in 8	15 to 60 m.
Cinchona	4 oz. red bark, proof „	1 in 5	½ to 2 drs.
Cinnamomi	2½ oz. bark, rectified „	1 in 8	½ to 2 drs.
Cocci	2½ oz. insects, proof „	1 in 8	1 to 2 drs.
Colchici Sem.	2½ oz. seeds, proof „	1 in 8	10 to 30 mins.
Conii	2½ oz. fruit, proof „	1 in 8	20 to 60 mins.
Croci	1 oz. stigmas, proof „	1 in 20	¼ to 1 dr.
Cubebæ	2½ oz. fruit, rectified „	1 in 8	½ to 2 drs.
Digitalis	2½ oz. leaves, proof „	1 in 8	10 to 30 mins.
Ergotæ	5 oz. ergot, proof „	1 in 4	5 to 30 mins.
Ferri Perchlor.	5 oz. strong liquor, 10 water and 5 oz. rectified spirit	1 in 4	10 to 30 mins.
Gallæ	2½ oz. galls, proof „	1 in 8	½ to 2 drs.
Gelsemii	2½ oz. root, proof „	1 in 8	5 to 20 mins.
Guaiaci Am.	4 oz. resin, sal volatile spirit	1 in 5	½ to 1 dr.
Hamamelidis	2 oz. bark, proof „	1 in 10	5 to 60 mins.
Hydrastis	2 oz. rhizome, proof „	1 in 10	½ to 1 dr.
Hyoscyami	2½ oz. leaves, proof „	1 in 8	½ to 1 dr.
Jaborandi	5 oz. leaves, proof „	1 in 4	½ to 1 dr.
Jalapæ	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Krameria	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Laricis	2½ oz. bark, rectified „	1 in 8	20 to 30 mins.
Limonis	2½ oz. fresh peel, proof „	1 in 8	½ to 2 drs.
Lobelia	2½ oz. herb, proof „	1 in 8	10 to 30 mins.
Lobelia Æth.	2½ oz. herb, spirit of ether.	1 in 8	10 to 30 mins.
Lupuli	2½ oz. strobiles, proof spirit	1 in 8	½ to 2 drs.
Myrrhæ	2½ oz. gum resin, rectified „	1 in 8	½ to 1 dr.
Nuc. Vomica	133 grs. extract, 4 oz. water, 16 oz. rectified spirit.	1 in 480	10 to 20 m.
Opii	1½ oz. opium, proof „	1 in 13½	5 to 40 m.
Podophylli	160 grs. resin, rectified „	1 in 60	¼ to 1 dr.
Pyrethri	4 oz. root, rectified „	1 in 5	Not taken.
Quassia	¾ oz. chips, proof „	1 in 27	½ to 2 drs.
Quinina	160 grs. hydrochlor. of qui- nine, tinct. of orange peel.	1 in 60	½ to 2 drs.
Sabina	2½ oz. tops, proof spirit	1 in 8	¼ to 1 dr.
Scilla	2½ oz. bulb, proof „	1 in 8	10 to 30 m.
Senega	2½ oz. root, proof „	1 in 8	½ to 2 drs.
Serpentaria	2½ oz. rhizome, proof „	1 in 8	½ to 2 drs.
Stramonii	2½ oz. seeds, proof „	1 in 8	10 to 30 m.
Strophanthi	1 oz. seeds, rectified „	1 in 20	2 to 10 m.
Sumbul	2½ oz. root, rectified „	1 in 8	10 to 30 m.
Tolutana	2½ oz. balsam, rectified „	1 in 8	20 to 40 m.
Valeriana	2½ oz. rhizome, proof „	1 in 8	1 to 2 drs.
Valerian. Am.	2½ oz. rhizome, sal volatile	1 in 8	½ to 1 dr.
Veratri Vir.	4 oz. rhizome, rectified spirit	1 in 5	5 to 20 m.
Zingiberis	2½ oz. rhizome, rectified „	1 in 8	¼ to 1 dr.
Zingib. Fort.	10 oz. rhizome, rectified „	1 in 2	5 to 20 m.

COMPLEX TINCTURES.

TINCTURA.	INGREDIENTS IN 1 PINT.	STRENGTH.	DOSE.
Aloes	$\frac{1}{2}$ oz. Socotrine aloes, $1\frac{1}{2}$ oz. extract of liquorice, proof spt.	1 in 40.	1 to 2 drs.
Catechu	$2\frac{1}{2}$ oz. catechu, 1 oz. cinnamon, proof spt.	1 in 8.	$\frac{1}{2}$ to 2 drs.
Chloroformi et Morphinæ (Chlorodyne.)	1 oz. chloroform, 2 drs. ether, 1 oz. spirit, 8 grs. hydrochlorate of morphine, $\frac{1}{2}$ oz. prussic acid, 4 m. oil of peppermint, 1 oz. liq. ext. liquorice, 1 oz. treacle, syrup q.s. to 8 oz.	1 in 8. (chloroform). 1 gr. in 1 oz. (morphine).	5 to 10 m.
Ferri Acet. ..	5 oz. strong solution of acetate of iron, 1 oz. acetic acid, 5 oz. rectified spirit, 9 oz. distilled water.	1 in 4.	5 to 30 m.
Iodi	$\frac{1}{2}$ oz. iodine, $\frac{1}{2}$ oz. iodide of potassium, rectified spt.	1 in 40.	5 to 20 m.
Kino	2 oz. gum kino, 3 oz. glycerine, 5 oz. water, 12 oz. rectified spt.	1 in 10.	$\frac{1}{2}$ to 2 drs.
Opii Ammon... (Scotch Paregoric.)	100 grs. of opium, 180 grs. each saffron and benzoic acid, 1 dr. oil of anise, 4 oz. strong solution of ammonia, rectified spirit.	1 in 96.	$\frac{1}{2}$ to 1 dr.
Rhei	2 oz. root, $\frac{1}{4}$ oz. each of coriander fruit and cardamoms and saffron, proof spirit.	1 in 10.	1 to 8 dr.
Sennæ	$2\frac{1}{2}$ oz. leaves, 2 oz. raisins, $\frac{1}{2}$ oz. each of caraway and coriander, proof spirit.	1 in 8.	<u>1 to 4 dr.</u>
Quininæ Am. ..	160 grs. sulphate of quinine, $2\frac{1}{2}$ oz. solution of ammonia, proof spirit.	1 in 60.	$\frac{1}{2}$ to 2 dr

COMPOUND TINCTURES.

Benzoini Co. .. (Friar's Balsam.)	2 oz. benzoin, $1\frac{1}{2}$ oz. storax, $\frac{1}{2}$ oz. tolu, 160 grs. Socotrine aloes, rectified spirit.	1 in 10.	$\frac{1}{2}$ to 1 dr.
Camphoræ Co. (Paregoric.)	40 grs. opium, 40 grs. benzoic acid, 30 grs. camphor, $\frac{1}{2}$ dr. oil of anise, proof spt.	1 in 320. 1 in 240. (opium.)	$\frac{1}{4}$ to 1 dr.
Cardamomi Co.	$\frac{1}{4}$ oz. seeds, $\frac{1}{4}$ oz. caraway, 2 oz. raisins, $\frac{1}{2}$ oz. cinnamon, 55 grs. cochineal, proof spt.	1 in 80.	$\frac{1}{2}$ to 2 drs.
Chloroformi Co.	2 oz. chloroform, 10 oz. tincture of cardamoms (compound), rectified spirit.	1 in 10.	20 to 60 m.
Cinchonæ Co...	2 oz. red bark, 1 oz. orange peel. $\frac{1}{2}$ oz. serpentary, 55 grs. saffron, 28 grs. cochineal, proof spirit.	1 in 10.	$\frac{1}{2}$ to 2 drs.
Gentianæ Co...	$1\frac{1}{2}$ oz. root, $\frac{3}{4}$ oz. orange peel, $\frac{1}{4}$ oz. cardamoms, proof spirit.	1 in $13\frac{1}{3}$.	$\frac{1}{2}$ to 2 drs.
Lavandulæ Co.	45 minims oil of lavender, 5 m. oil of rosemary, 75 grs. each cinnamon and nutmeg, 150 grs. red sandal wood, rectified spirit.	1 in 213.	$\frac{1}{2}$ to 2 drs.

to be used in the same manner as the other pieces of clothing.

The student should remember the exceptions to the common strength in tinctures—thus in each pint—

Tinctura Camphoræ Composita	-	-	-	contains 30 grs. (camphor).
Tinctura Lavandulæ Composita	-	-	-	" 45 min. (oil).
Tinctura Opii Ammoniata	-	-	-	" 100 grs. (opium).
Tinctura Nucis Vomicae	-	-	-	" 133 grs. (extract).
Tinctura Podophylli	-	-	-	" 160 grs. (resin).
Tinctura Cantharidis	-	-	-	" $\frac{1}{4}$ oz.
Tinctura Cardam. Co.	-	-	-	
Tinctura Quininæ	-	-	-	" 160 grs. <i>T. Podophylli</i>
Tinctura Quininæ Amm.	-	-	-	
Tinctura Aloes	-	-	-	" $\frac{1}{2}$ oz.
Tinctura Iodi	-	-	-	
Tinctura Quassiae	-	-	-	" $\frac{3}{4}$ oz. . .
Tinctura Capsici	-	-	-	
Tinctura Arnicae	-	-	-	" 1 oz.
Tinctura Belladonnæ	-	-	-	
Tinctura Cannabis Ind.	-	-	-	
Tinctura Croci	-	-	-	
Tinctura Strophanthi	-	-	-	
Tinctura Gentianæ Co.	-	-	-	" $1\frac{1}{2}$ oz.
Tinctura Opii	-	-	-	
Tinctura Aurantii	-	-	-	" 2 oz.
Tinctura Benzoini Co.	-	-	-	
Tinctura Chloroformi Co.	-	-	-	
Tinctura Cinchonæ Co.	-	-	-	
Tinctura Hamamelidis	-	-	-	
Tinctura Hydrastis	-	-	-	
Tinctura Kino	-	-	-	
Tinctura Rhei	-	-	-	" 4 oz.
Tinctura Cinchonæ	-	-	-	
Tinctura Guaiaci Amm.	-	-	-	
Tinctura Pyrethri	-	-	-	
Tinctura Veratri Viridis	-	-	-	" 5 oz.
Tinctura Ergotæ	-	-	-	
Tinctura Ferri Acetatis	-	-	-	
Tinctura Ferri Perchloridi	-	-	-	
Tinctura Jaborandi	-	-	-	" 6 oz.
Tinctura Aurantii Recentis	-	-	-	
Tinctura Zingiberis Fortior	-	-	-	" 10 oz.

The remaining thirty-seven tinctures contain $2\frac{1}{2}$ oz. to the pint.

Trochisci (Lozenges—13 in number) are small tablets, composed of sugar and gum, blended with a medicinal substance. The student can distinguish most of the lozenges by their colour, thus—Bismuth, chlorate of potassium, santonin, and soda are white; morphine a dirty white, sulphur is a very pale yellow, tannic acid is a light fawn, and ipecacuanha is buff, morphine and ipecacuanha is a cream colour, catechu a *light* brown, opium a *dark* brown, and iron is an iron-grey colour. The odour of roses distinguishes bismuth from soda and chlorate of potassium. The active ingredients can be easily recognised in each lozenge by the tongue. Each lozenge will weigh about 15 grs., except bismuth, which is much larger. The Pharmacopœia generally directs—"Mix the powders, and add the mucilage and water to form a proper mass; divide into 720 lozenges, and dry these in a hot-air chamber with a moderate heat."

TROCHISCI.	INGREDIENTS.	GRAINS IN EACH.
Acidi Benzoici ..	Benzoic acid, sugar, gum, mucilage, and water.	$\frac{1}{2}$ gr.
Acidi Tannici ..	Tannin, tincture of <u>tolu</u> , sugar, gum, mucilage, and water.	$\frac{1}{2}$ gr.
Bismuthi	Subnitrate of bismuth, carbonate of magnesium, carbonate of calcium, sugar, gum, mucilage, and rose water.	2 grs.
Catechu	Catechu, sugar, gum, mucilage and water.	1 gr.
Ferri Redacti ..	Reduced iron, sugar, gum, mucilage and water.	1 gr.
Ipecacuanhæ.. ..	Ipecacuanha, sugar, gum, mucilage and water.	$\frac{1}{4}$ gr.
Morphinæ	Hydroch. of morphine, <u>tincture of tolu</u> , sugar, gum, mucilage & water.	$\frac{1}{36}$ gr.
Morphinæ & Ipecac	Do. with the addition of ipecacuan.	$\frac{1}{36}$ and $\frac{1}{12}$
Opium	Extract of opium, <u>tincture of tolu</u> , sugar, gum, extract of liquorice and water.	$\frac{1}{10}$ gr.
Potassii Chloratis	Chlorate of potassium, sugar, gum, mucilage and water.	5 grs.
Santonini.. ..	Santonin, sugar, gum, mucilage and water.	1 gr
Sodii Bicarb. ..	Bicarbonate of sodium, sugar, gum, mucilage and water.	5 grs.
Sulphuris	Precipitated sulphur, cream of tartar, sugar, gum, mucilage, and tincture of orange.	5 grs.

Unguenta (Ointments—45 in number) are mixtures of medicinal substances with lard, paraffin, lanoline or wax and oil, of the consistence of butter; for external application; 31

contain lard in some form. The 8 ointments of mercury require separate notice.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Acidi Borici	Boric acid, soft and hard paraffin.	1 in 7.
Acidi Carbolic	Carbolic acid, soft and hard paraffin	1 in 19.
Acidi Salicylici	Salicylic acid, soft and hard paraffin.	1 in 28.
<i>omit</i> Aconitinæ	Aconitine, spirit, benzoated lard.	8 grs. to 1 oz.
Antim. Tartar.	Tartar emetic and simple oint.	1 in 5.
Atropinæ	Atropine, spirit, and benzoated lard	8 grs. to 1 oz.
Belladonnæ	Alcoholic extract and benzoated lard.	50 grs. to 1 oz
<i>omit</i> Calaminæ	Prepared calamine and benzo. lard.	1 in 6.
Cantharidis	Cantharides, yellow wax, olive oil.	1 in 8.
Cetacei	Spermaceti, white wax, almond oil, and benzoin.	1 in 5.
Chrysarobini	Chrysarobin and benzoated lard.	1 in 25.
<i>MS</i> Coni	Juice of hemlock, lanoline, and boric acid.	2 in 1.
<i>omit</i> Creasoti	Creasote and simple ointment.	1 in 9.
Elemi	Elemi and simple ointment.	1 in 5.
Eucalypti	Oil of eucalyptus, soft and hard paraffin.	1 in 5.
Gallæ	Galls and benzoated lard.	80 grs. to 1 oz
Gallæ cum Opio	Ointment of galls and opium.	32 grs. to 1 oz
Glycerini Plumbi Subacetatis	Glycerine of subacetate of lead, soft and hard paraffin.	1 in 6.
Hamamelidis	Liquid extract and simple oint.	1 in 10.
Iodi	Iodine, iodide of potassium, glycerine and lard.	1 in 31.
Iodoformi	Iodoform and benzoated lard.	1 in 10.
Picis Liquidæ	Tar and yellow wax.	5 in 7.
Plumbi Acetatis	Acetate of lead and benzoated lard.	12 grs. to 1 oz
Plumbi Carbonatis	Carbonate of lead and simple oint.	1 in 8.
Plumbi Iodidi	Iodide of lead and simple oint.	1 in 8.
<i>omit</i> Potassæ Sulphuratæ	Sulphurated potash, hard and soft paraffin.	30 grs. to 1 oz
Potassii Iodidi	Iodide and carbonate of potassium, water, and benzoated lard.	1 in 8 $\frac{3}{4}$.
Resinæ	Resin, yellow wax, almond oil, and simple ointment.	1 in 3 $\frac{3}{4}$.
<i>omit</i> Sabinæ	Fresh savin tops, yellow wax, and benzoated lard.	8 to 19.
<i>omit</i> Simplex	White wax 2 oz., benzoated lard 3 oz., and almond oil 3 oz.	
Staphisagriæ	Stavesacre seeds and benz. lard.	1 in 3.
Sulphuris	Sublimed sulphur, benzoated lard.	1 in 5.
Sulphuris Iodidi	Iodide of sulphur, hard and soft paraffin.	30 grs. to 1 oz
<i>omit</i> Terebinthinæ	Oil of turpentine, resin, yellow wax, and lard.	1 in 2.
Veratrinæ	Veratrine, olive oil, hard and soft paraffin.	1 in 63.
Zinci	Oxide of zinc and benzoated lard.	80 grs. to 1 oz
Zinci Oleati	Oleate of zinc and soft paraffin.	1 in 2.

OINTMENTS OF MERCURY.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Hydrargyri.. ..	1 lb. mercury, 1 lb. lard, 1 oz. suet.	1 in 2.
Hydrg. Ammoniati	50 grs. ammoniated mercury, 450 grs. simple ointment.	1 in 10.
Hydrarg. Comp. ..	6 oz. mercurial ointment, 3 oz. olive oil, 3 oz. yellow wax, 1½ oz. camphor.	1 in 4½ (of Hg.)
Hydrg. Iodidi Rubri	16 grs. red iodide, 1 oz. simple ointment.	16 grs. to 1 oz
Hydrg. Nitratis ..	4 oz. mercury, 12 oz. nitric acid, 15 oz. lard, 32 oz. olive oil.	1 in 15½ (of Hg.)
Hydrg. Nitratis Dil.	1 oz. ointment of nitrate of mercury, soft paraffin 2 oz..	1 in 3.
Hydrg. Oxidi Rubri	62 grs. red precipitate, ¼ oz. hard paraffin, and ¾ oz. soft paraffin.	1 in 8.
Hydrg. Subchloridi	80 grs. calomel, 1 oz. benzoated lard	80 grs. to 1 oz

Vapores (Inhalations—6 in number) are preparations in which the vapour of some medicinal substance is taken into the air passages alone, or mixed with the vapour of water.

INHALATIONS.

VAPOR.	INGREDIENTS.
Acidi Hydrocyanici	10 to 15 minims diluted hydrocyanic acid in 1 dr. cold water, and the vapour to be inhaled.
Chlori	2 oz. chlorinated lime, cold water q.s., do.
Coninæ	½ oz. juice of hemlock, 1 dr. solution of potash, 1 oz. water, the vapour of hot water is made to pass through 20 mins. of this.
Creasoti	12 minims creasote and 8 oz. boiling water, air to be passed through the solution and inhaled.
Iodi	1 dr. tincture of iodine, 1 oz. water, and apply heat before inhaling.
Olei Pini Sylvestris	40 mins. fir-wool oil, 20 grs. light carbonate of magnesium, water to 1 oz., 1 drachm of this to be added to ½ pint boiling water and ½ pint cold water.

Vina (Wines—of which there are 11 in number) are simply tinctures made with sherry and orange wine instead of proof spirit.

VINUM.	COMPOSITION.	STRENGTH.	DOSE.
Aloes	Socotrine aloes, cardamoms, ginger and sherry.	$\frac{3}{4}$ oz. to 1 pint.	1 to 2 drs. <i>om</i>
Antimoniale ..	Tartar emetic and sherry.	2 grs. to 1 oz.	5 to 60 m.
Aurantii	(Used for citrate of iron and quinine wines.)	12 per cent. [alcohol.]	—
Colchici	4 oz. dried corm and 1 pint sherry.	1 in 5.	10 to 20 m.
Ferri	1 oz. iron wire and 1 pint sherry.	Variable.	1 to 4 drs.
Ferri Citratis ..	Citrate of iron and ammonium, orange wine.	1 gr. in 1 dr.	1 to 4 drs.
Ipecacuanhæ ..	Ipecacuanha, acetic acid, distilled water, & sherry.	22 grs. to 1 oz.	$\frac{1}{2}$ to 6 drs.
Opii	Extract of opium, cinnamon, cloves, and sherry.	22 grs. to 1 oz.	10 to 40 m. <i>om</i>
Quininæ	Sulphate of quinine, citric acid, and orange wine.	1 gr. to 1 oz.	$\frac{1}{2}$ to 1 oz.
Rhei	Rhubarb root, cancella bark, and sherry.	33 grs. to 1 oz.	1 to 2 drs. <i>om</i>
Xericum	(A Spanish wine.)	17 per cent. [alcohol.]	—

The following groups of vegetable substances in the B.P. are of considerable importance :—

Alkaloids.—The following are a few of the distinguishing characters of this group of active nitrogenous principles or organic bases :—They all contain nitrogen ; they turn red litmus blue ; they may be regarded as compound ammonias ; they combine with acids to form salts easily soluble in water, though they themselves are generally insoluble in water. The following are the pure alkaloids of the B.P. :—Aconitine, Atropine, Caffeine, Codeine, Physostigmine, Strychnine, Veratrine.

The following salts of alkaloids are contained in the B.P. :—Apomorphine Hydrochlorate, Atropine Sulphate, Beberine Sulphate, Caffeine Citrate, Cinchonine and Cinchonidine Sulphates, Cocaine Hydrochlorate, Homatropine Hydrobromate, Morphine Sulphate, Acetate, Bimeconate and Hydrochlorate, Quinine Hydrochlorate and Sulphate, and Strychnine Hydrochlorate.

Neutral Principles are bodies closely resembling the alkaloids in action and of complicated chemical constitution—they are Aloin, Chrysarobin, Elaterin, Ergotin, Salicin, Santonin, and Picrotoxin. (Chrysarobin and Ergotin are not *pure* principles).

Glucosides.—Some of the above neutral principles under the action of ferments and acids split up into glucose, alcohols, &c.,

these are known as Glucosides, as Picrotoxin, Santonin, Salicin, and Tannic Acid.

☞ The student should note the terminology of these bodies. The English names of the alkaloids end in *ine*, and the Latin in *ina*, whilst the neutral principles and glucosides end in *in*, and the Latin in *inum*, except in the case of Aloin. (Lupulin and Euonymin do not belong to these groups).

Gums are complex viscid bodies obtained by exudation from the stems, or stems and branches of plants. They contain arabin or bassorin, or both. The B.P. representatives are Acacia and Tragacanth. (Eucalyptus and Kino are not true gums).

Resins are solid, brittle, non-volatile, complex bodies, generally resulting from the oxidation of volatile hydrocarbons; they are insoluble in water and soluble in alkalies and spirit.

The B.P. representatives are Guaiacum, Jalap, Scammony, and Podophyllum.

Burgundy Pitch and Mastich are generally included in the list of resins.

Gum-Resins are exudations containing variable proportions of gums, resins, and volatile oils. They form emulsions when rubbed up with water, the soluble viscid gum forming a solution which keeps the resinous and oily particles in suspension.

The B.P. representatives are Ammoniacum, Asafoetida, Galbanum, Gamboge, Myrrh, and Scammony.

Oleo-Resins are complex bodies consisting of various proportions of resins and volatile oils. The B.P. *named* member of this group is Oleo-resin of Cubebs, but the following drugs are also true Oleo-resins:—Copaiba, Elemi, Canada Balsam, and Common Frankincense.

Balsams are resinous or oleo-resinous bodies containing either benzoic or cinnamic acids, or both. Those contained in the B.P. are Peruvian and Tolu Balsams, Benzoin and Prepared Storax.

☞ Neither of the so-called Canada or Copaiba Balsams belong to this group.

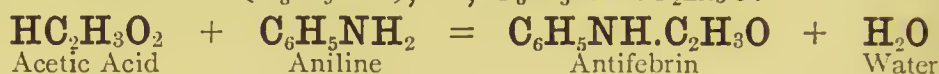
Stearoptenes are crystalline oxidised hydrocarbons or solid volatile oils, as Camphor, Menthol, and Thymol.

CHEMICAL REACTIONS

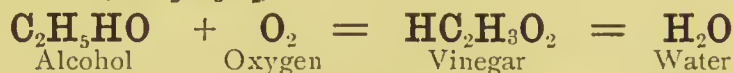
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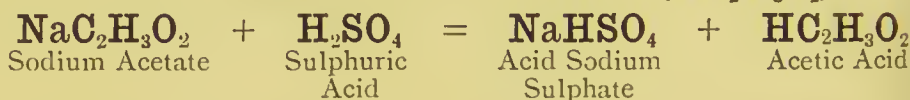
Acetanilidum (C_8H_9NO), or, $C_6H_5NH.C_2H_3O$.



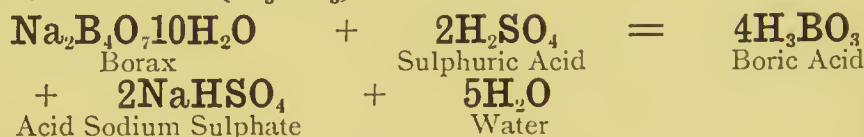
Acetum ($HC_2H_3O_2$).



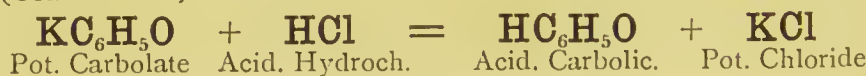
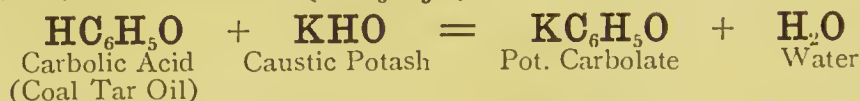
Acid. Aceticum and **Acid. Acet. Glac.** ($HC_2H_3O_2$).



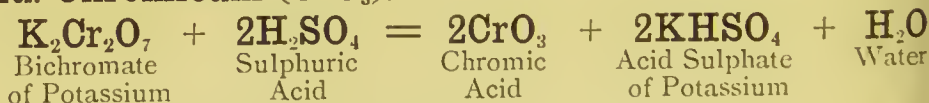
Acid. Boricum (H_3BO_3).



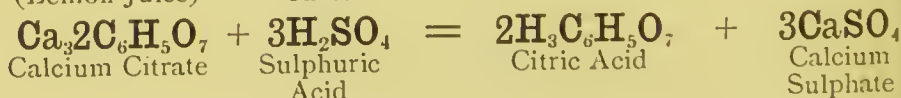
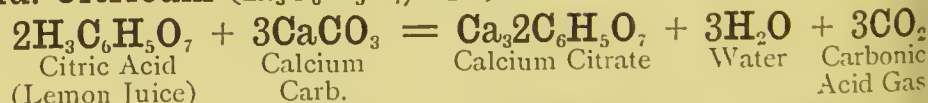
Acid. Carbolicum (HC_6H_5O).

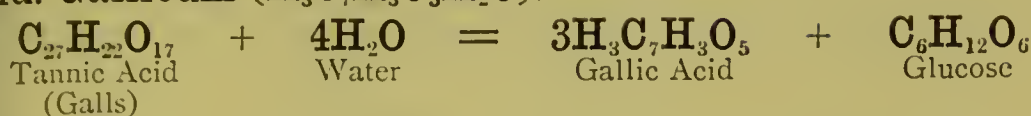
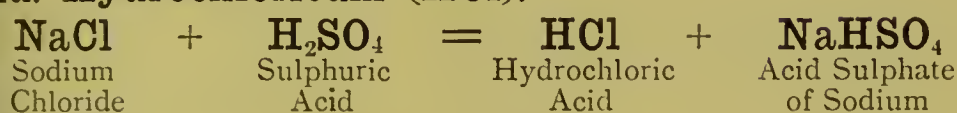
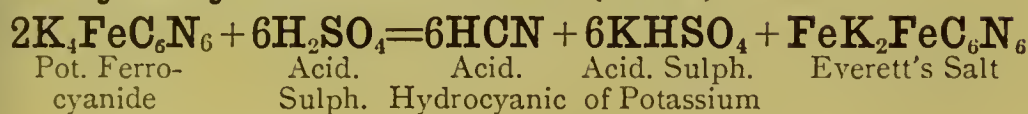
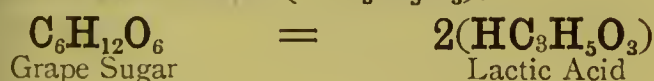
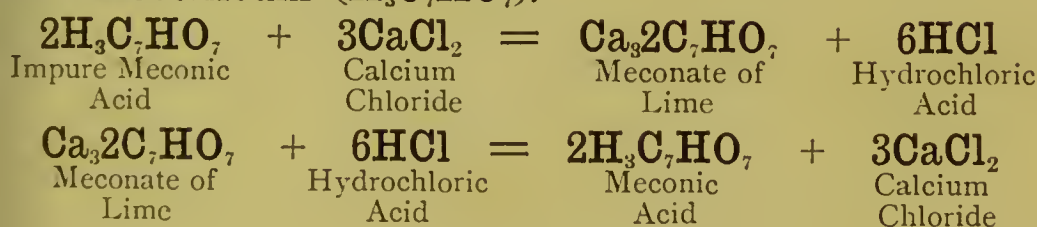
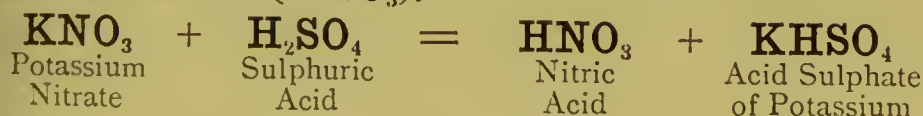
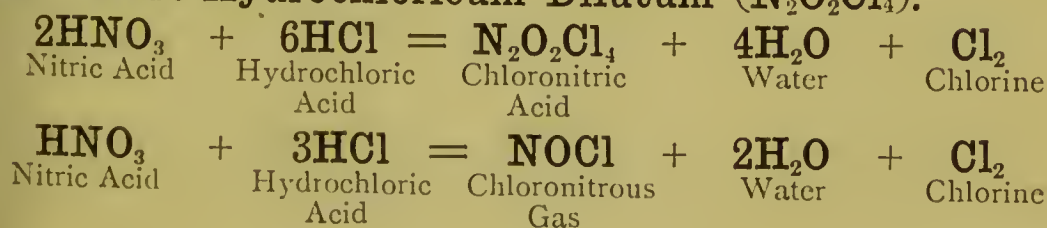


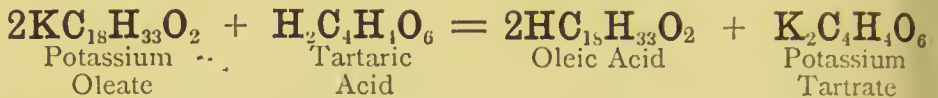
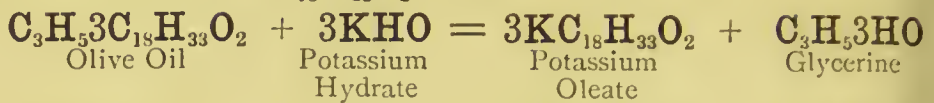
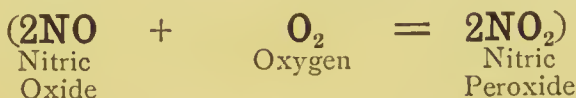
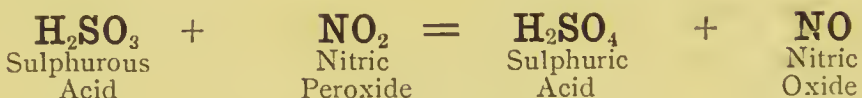
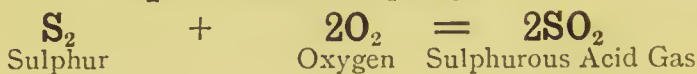
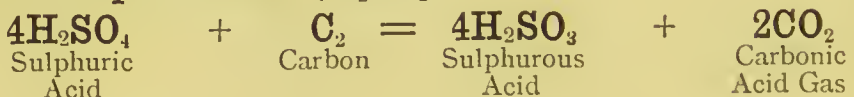
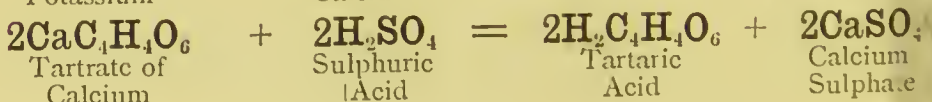
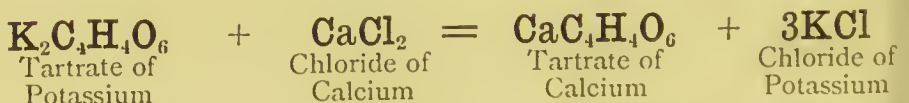
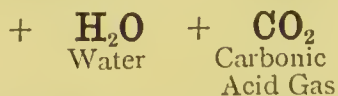
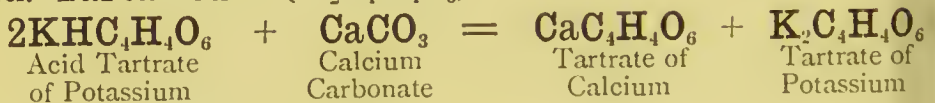
Acid. Chromicum (CrO_3).



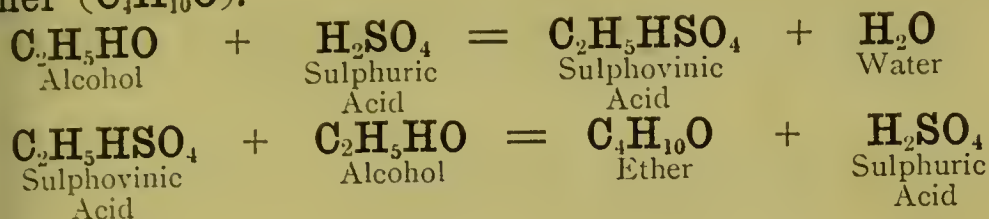
Acid. Citricum ($H_3C_6H_5O_7, H_2O$).



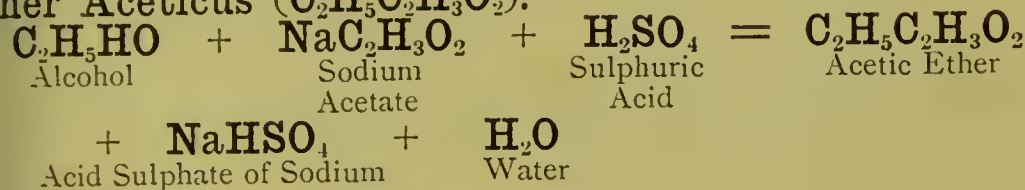
Acid. Gallicum ($\text{H}_3\text{C}_7\text{H}_3\text{O}_5\text{H}_2\text{O}$).Acid. Hydrobromicum Dilutum (HBr).Acid. Hydrochloricum (HCl).Acid. Hydrocyanicum Dilutum (HCN).Acid. Lacticum ($\text{HC}_3\text{H}_5\text{O}_3$).Acid. Meconicum ($\text{H}_3\text{C}_7\text{HO}_7$).Acid. Nitricum (HNO_3).Acid. Nitro-Hydrochloricum Dilutum ($\text{N}_2\text{O}_2\text{Cl}_4$).

Acid. Oleicum ($\text{HC}_{18}\text{H}_{33}\text{O}_2$).**Acid. Phosphoricum Concentratum (H_3PO_4).****Acid. Salicylicum ($\text{HC}_7\text{H}_5\text{O}_3$).****Acid. Sulphuricum (H_2SO_4).****Acid. Sulphurosum (H_2SO_3).****Acid. Tartaricum ($\text{H}_2\text{C}_4\text{H}_4\text{O}_6$).**

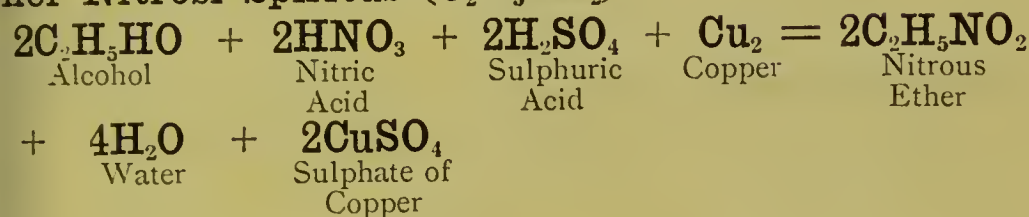
Ether ($C_4H_{10}O$).



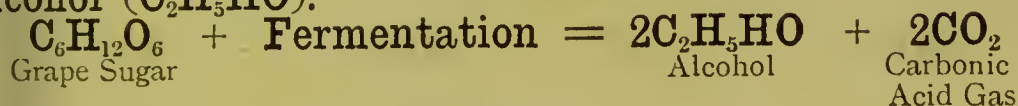
Ether Aceticus ($C_2H_5C_2H_3O_2$).



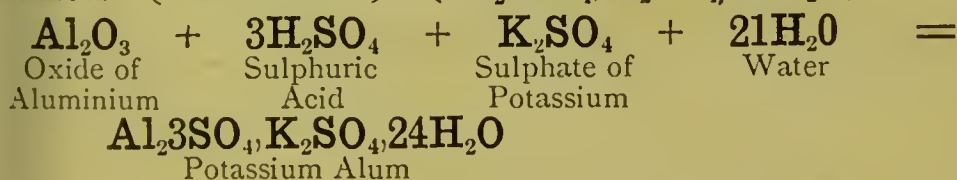
Ether Nitrosi Spiritus ($C_2H_5NO_2$).



Alcohol (C_2H_5HO).



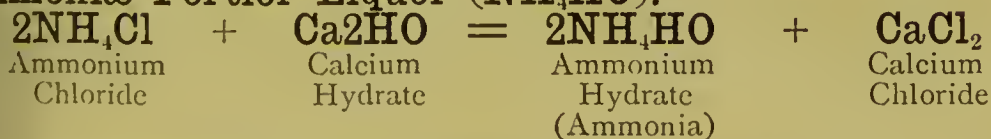
Alumen—(Potassium)—($Al_23SO_4, K_2SO_4, 24H_2O$).



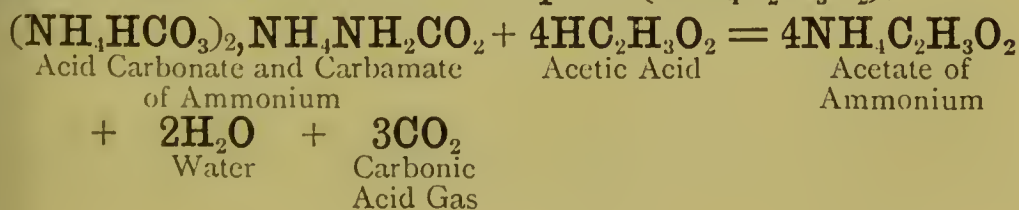
Alumen—(Ammonium)— $Al_23SO_4, (NH_4)_2SO_4, 24H_2O$.

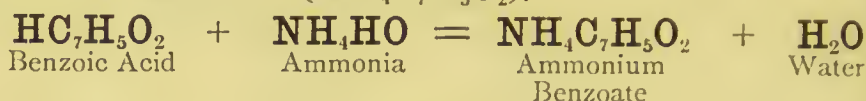
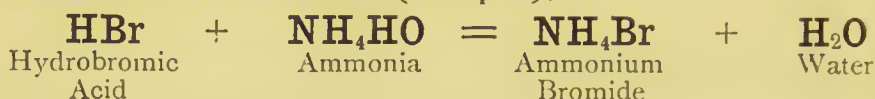
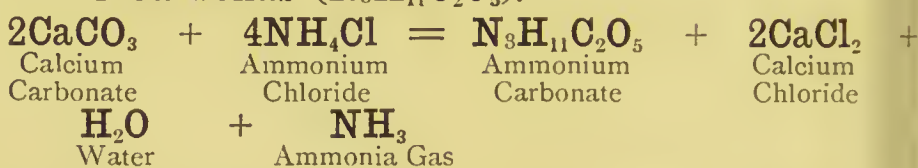
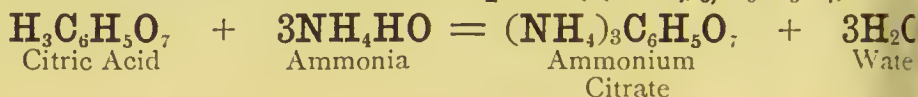
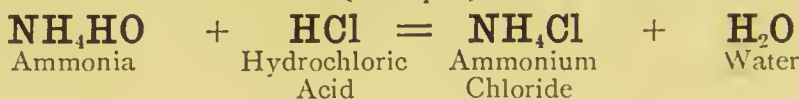
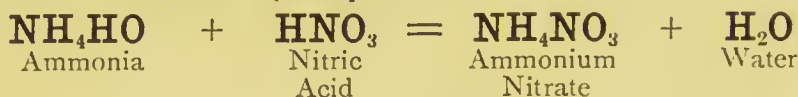
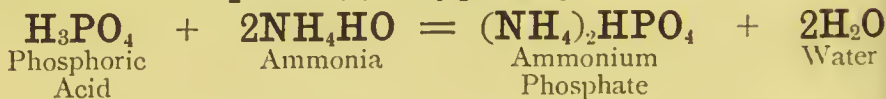
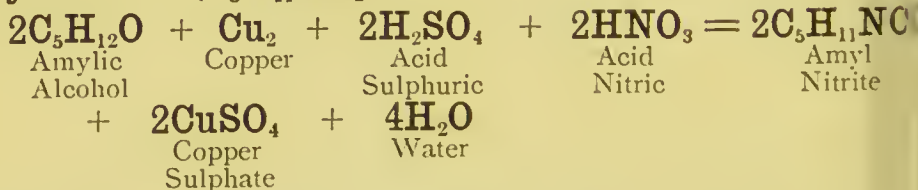
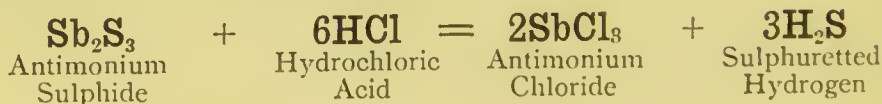
As above, substituting $(NH_4)_2SO_4$ for K_2SO_4

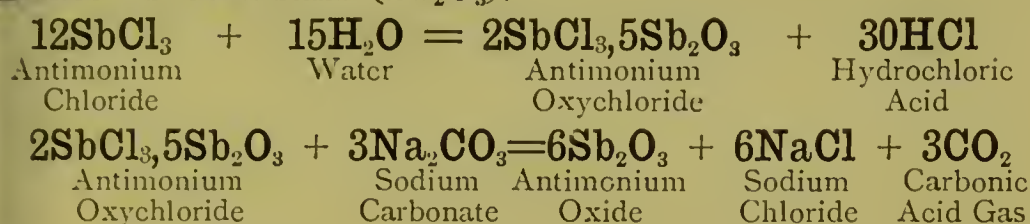
Ammoniaë Fortior Liquor (NH_4HO).



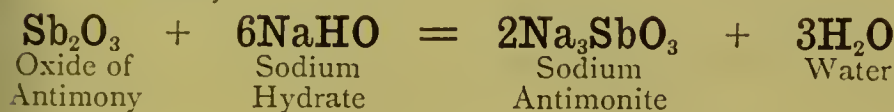
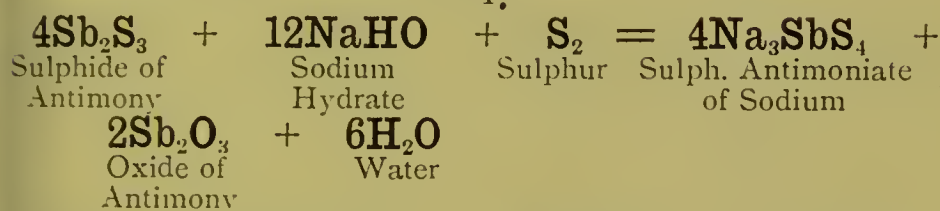
Ammonii Acetatis Fortior Liquor ($NH_4C_2H_3O_2$).



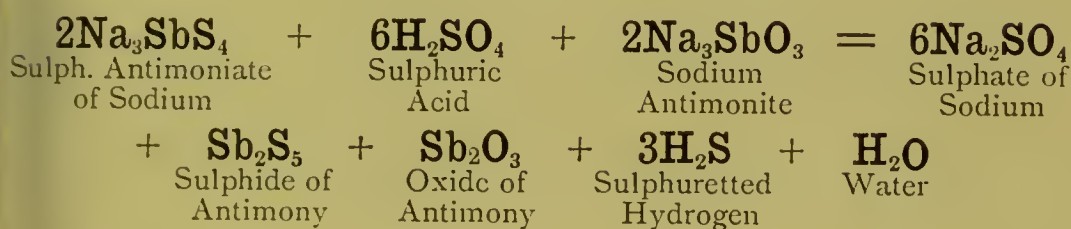
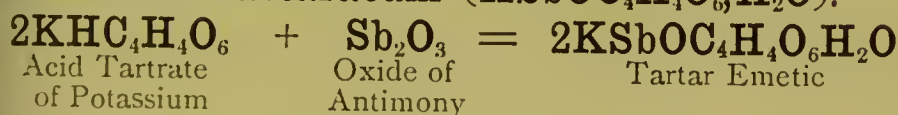
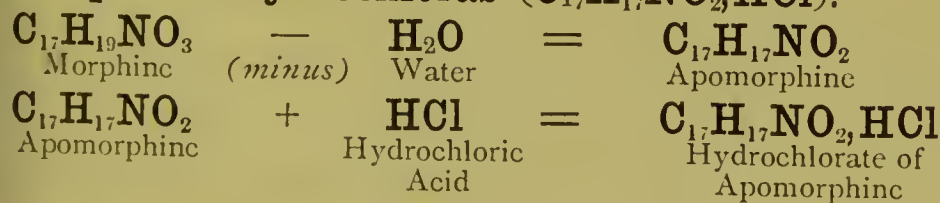
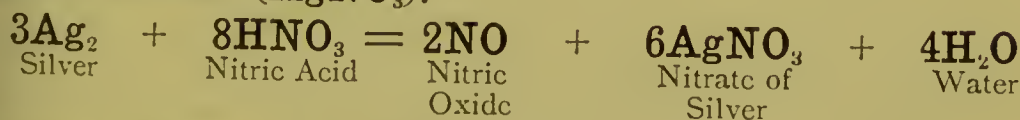
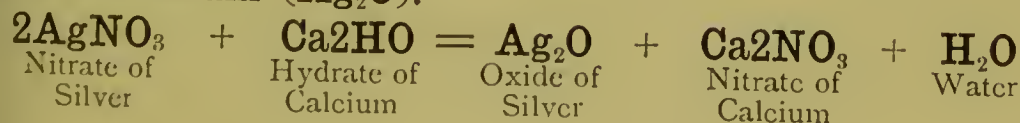
Ammonii Benzoas ($\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$).**Ammonii Bromidum** (NH_4Br).**Ammonii Carbonas** ($\text{N}_3\text{H}_{11}\text{C}_2\text{O}_5$).**Ammonii Citratis Fortior Liquor** ($(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$).**Ammonii Chloridum** (NH_4Cl).**Ammonii Nitras** (NH_4NO_3).**Ammonii Phosphas** ($(\text{NH}_4)_2\text{HPO}_4$).**Amyl Nitris** ($\text{C}_5\text{H}_{11}\text{NO}_2$).**Antimonii Chloridi Liquor** (SbCl_3).

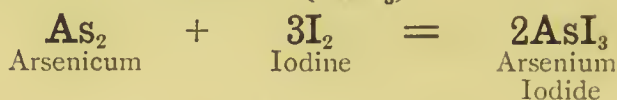
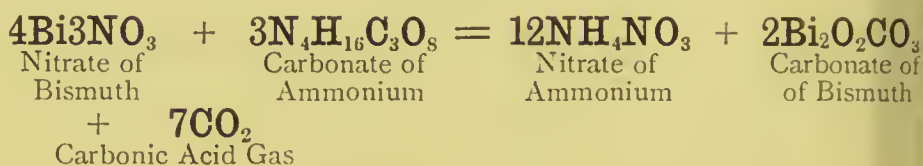
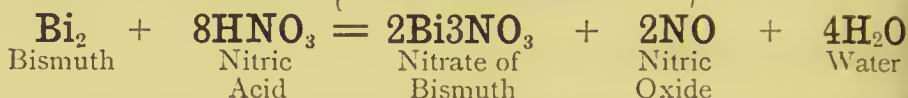
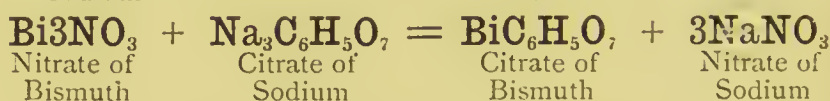
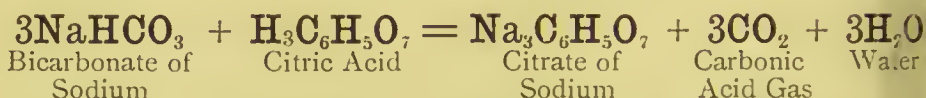
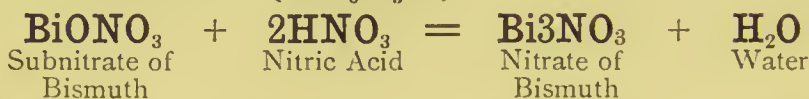
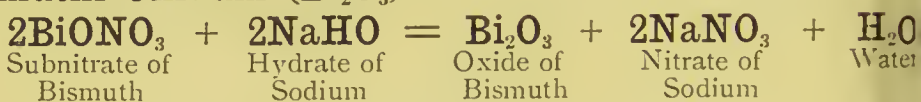
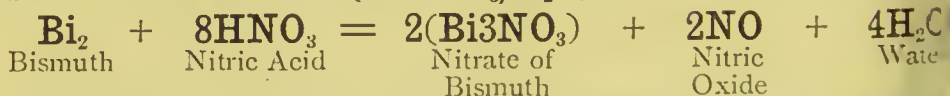
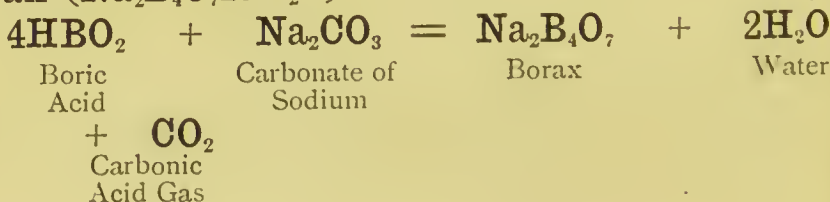
Antimonii Oxidum (Sb_2O_3).**Antimonium Sulphuratum.**

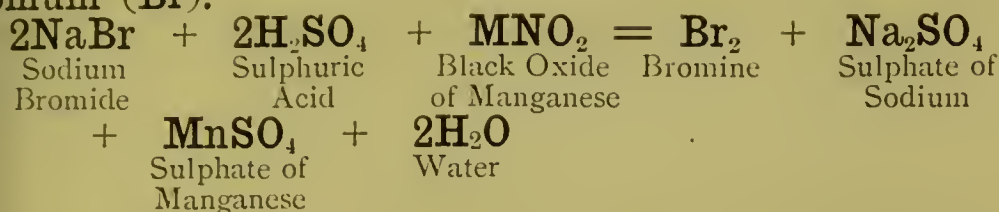
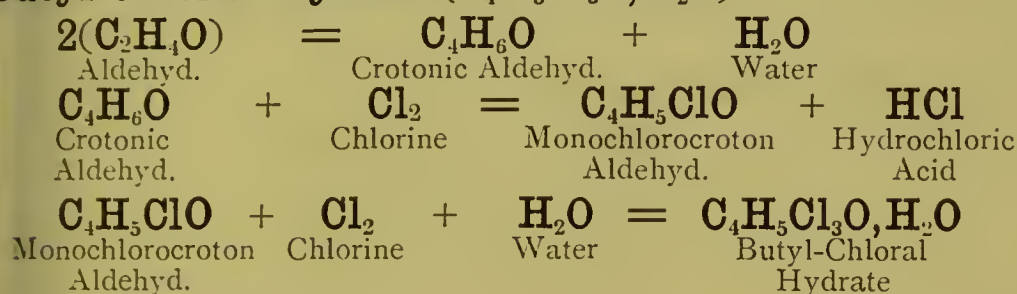
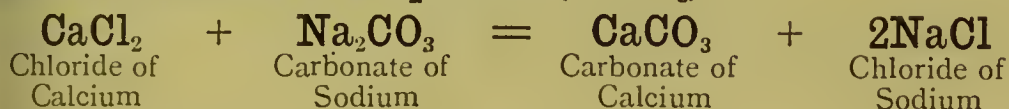
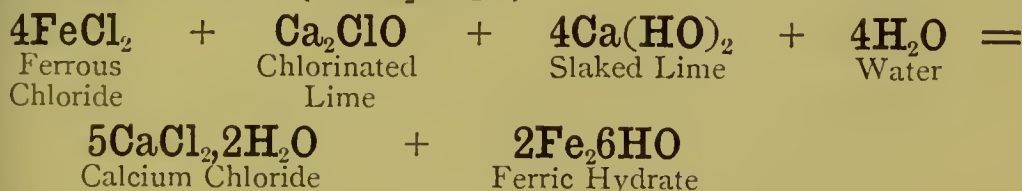
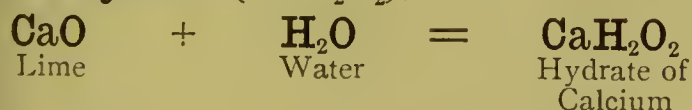
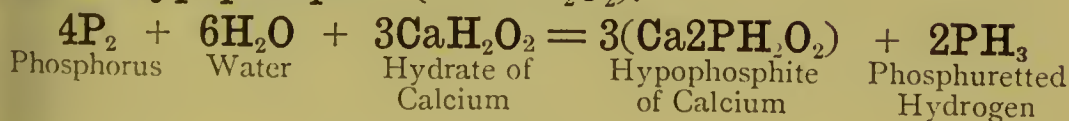
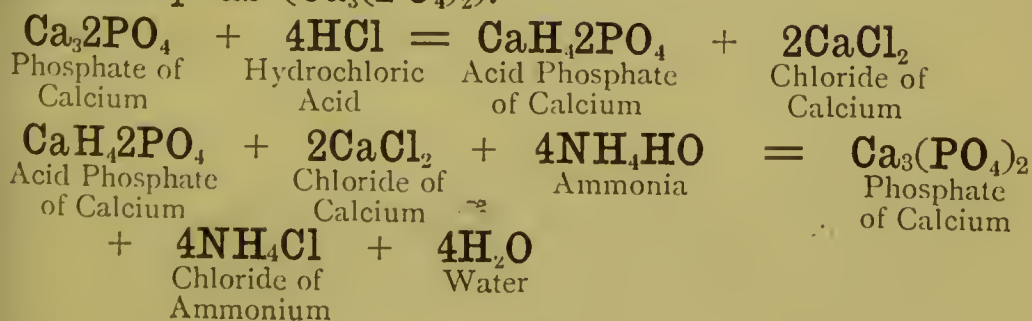
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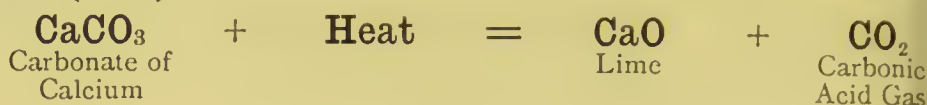
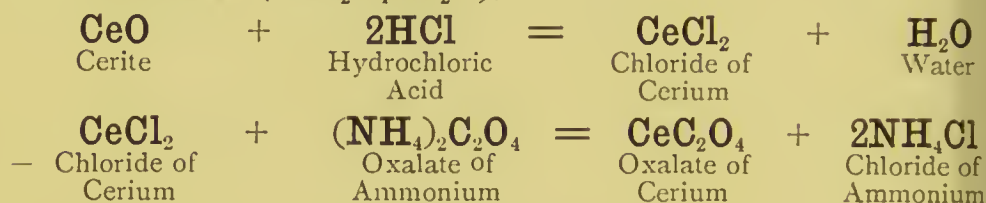
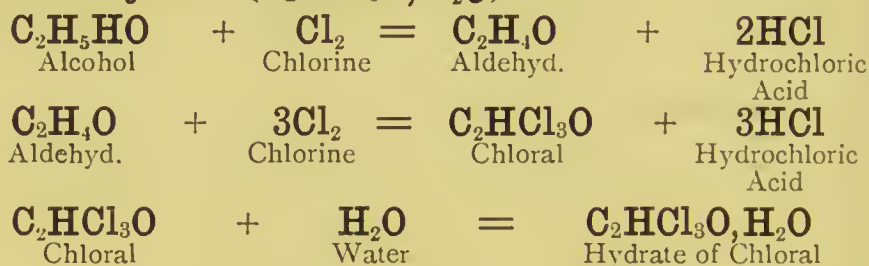
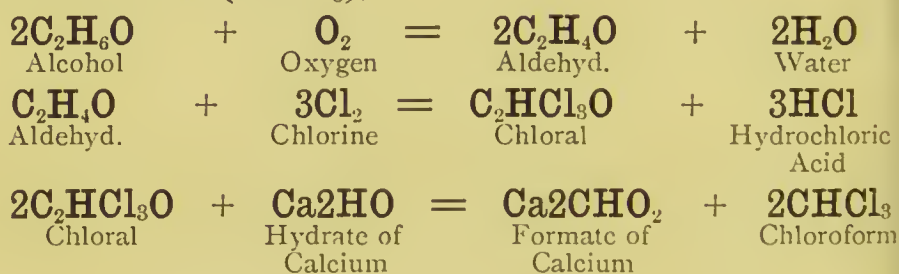
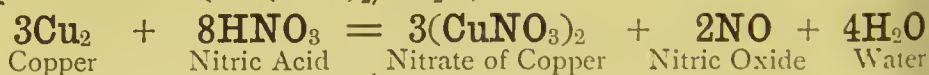


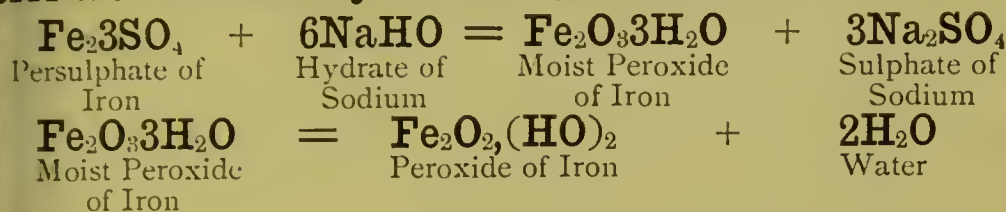
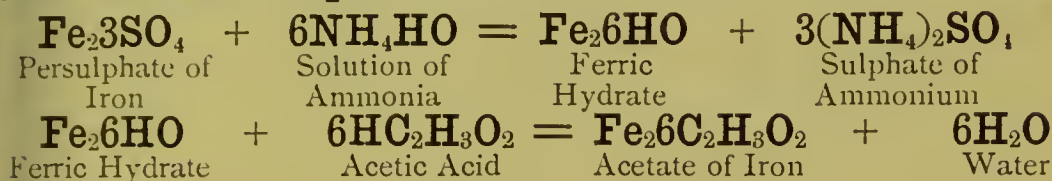
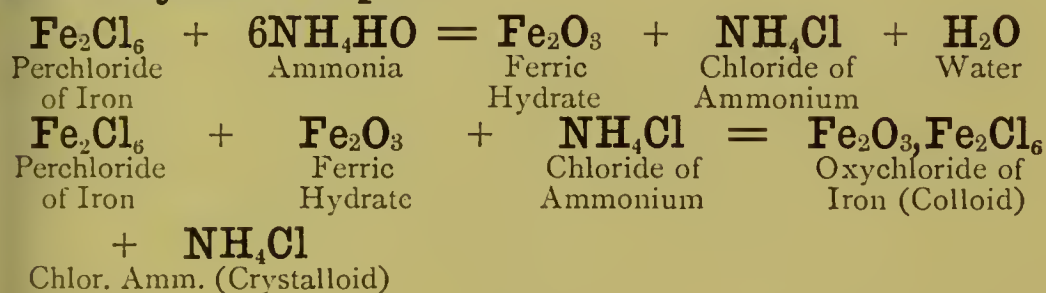
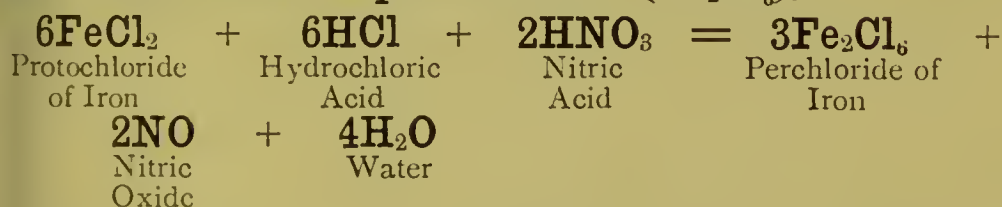
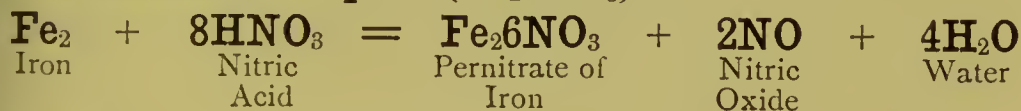
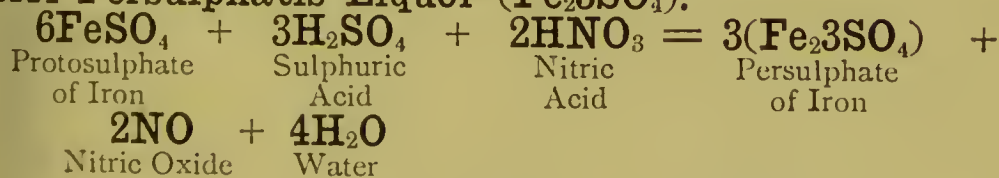
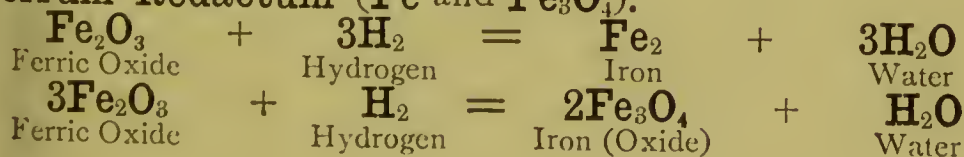
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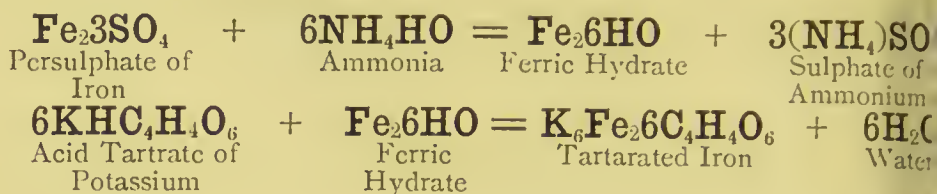
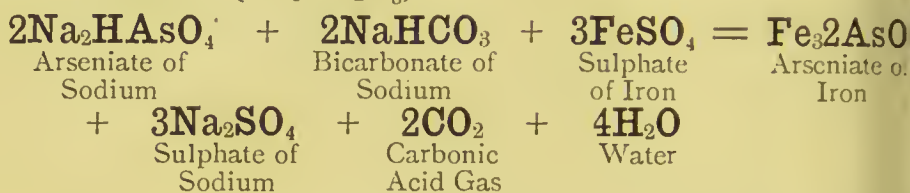
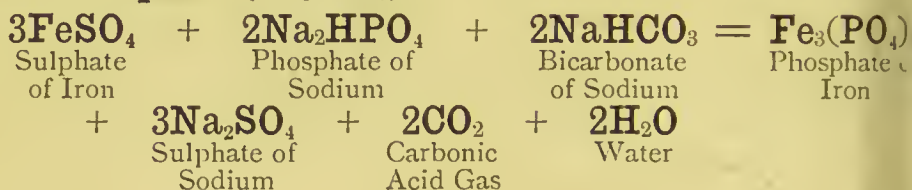
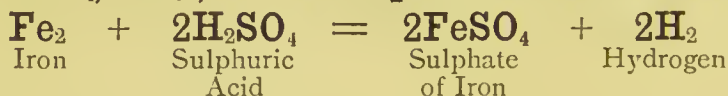
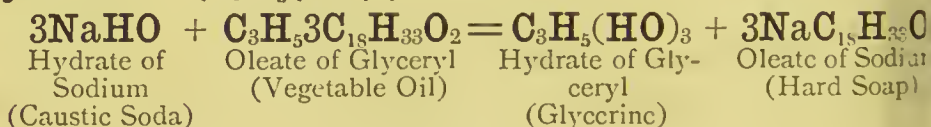
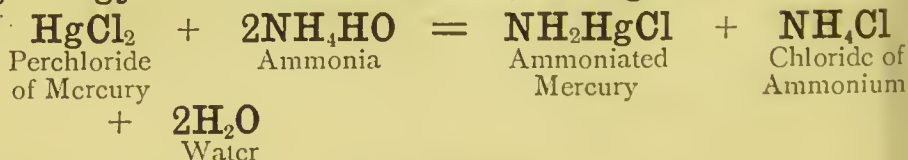
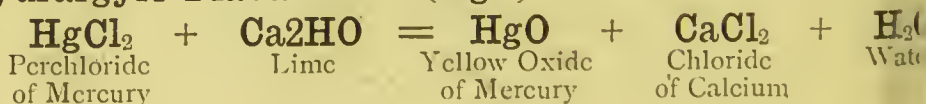
**Antimonium Tartaratum ($\text{KSbOC}_4\text{H}_4\text{O}_6, \text{H}_2\text{O}$).****Apomorphinæ Hydrochloras ($\text{C}_{17}\text{H}_{17}\text{NO}_2, \text{HCl}$).****Argenti Nitras (AgNO_3).****Argenti Oxidum (Ag_2O).**

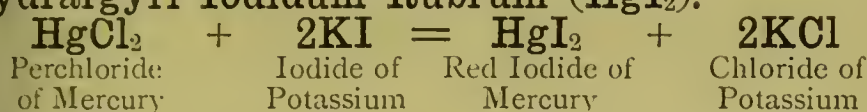
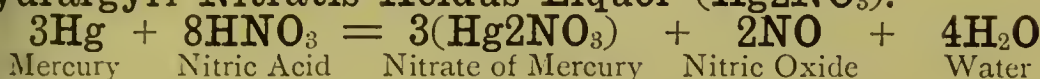
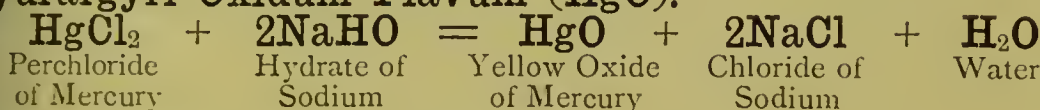
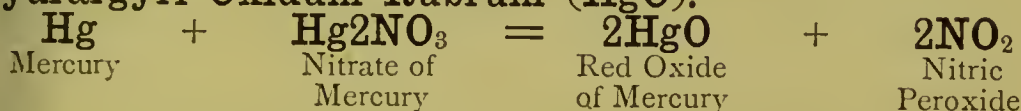
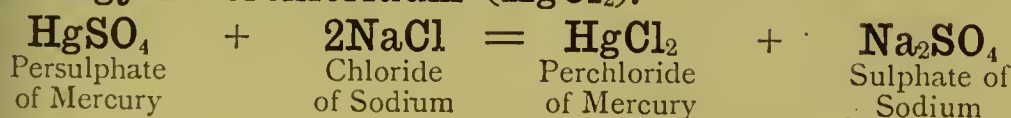
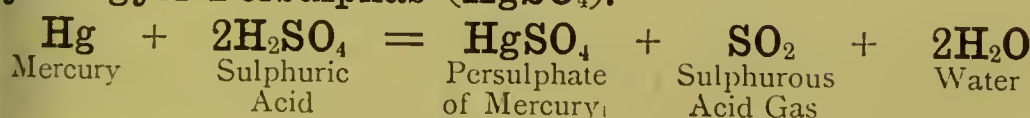
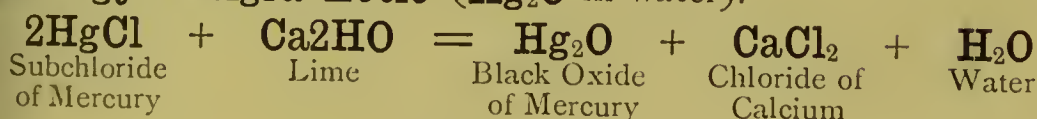
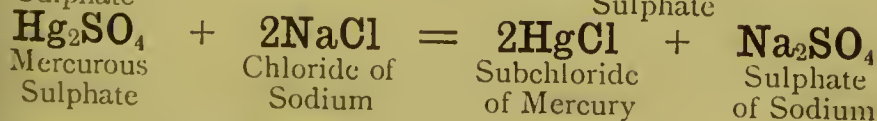
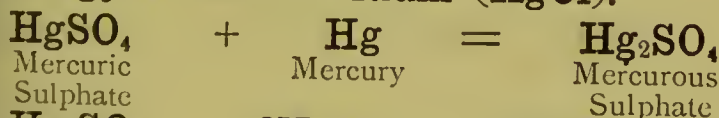
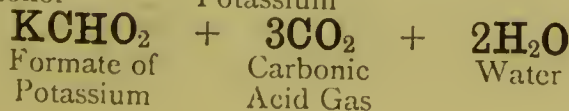
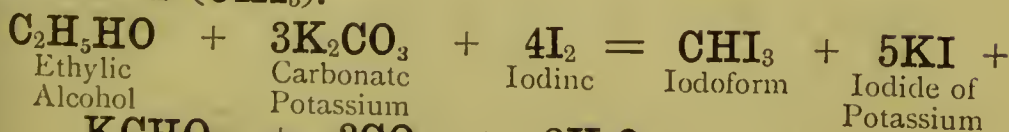
Arsenii Iodidum (AsI₃).**Bismuthi Carbonas { (Bi₂O₂CO₃)₂, H₂O } .****Bismuthi Citras (BiC₆H₅O₇).****Bismuthi Oxidum (Bi₂O₃).****Bismuthi Subnitras (BiONO₃, H₂O).****Borax (Na₂B₄O₇·10H₂O).**

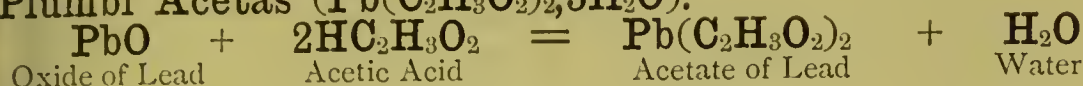
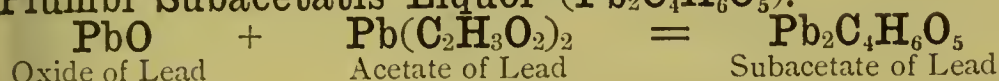
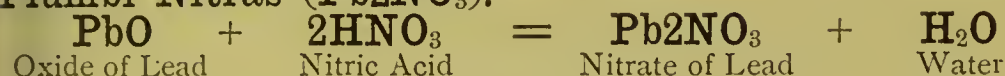
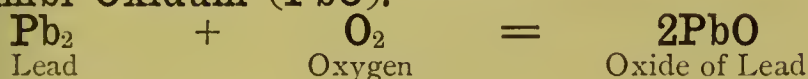
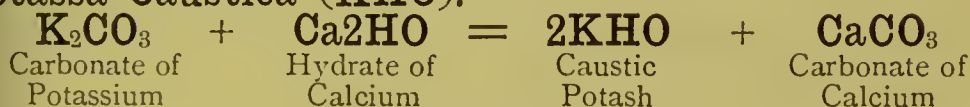
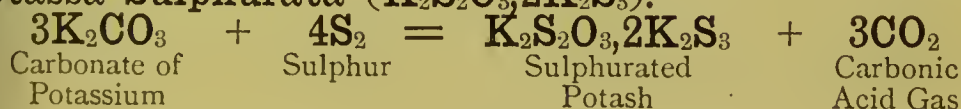
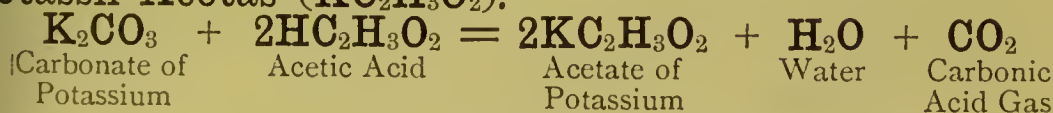
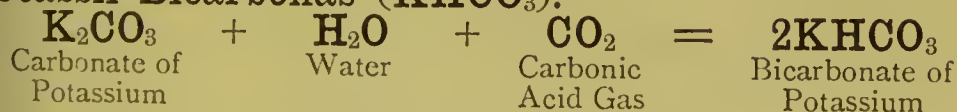
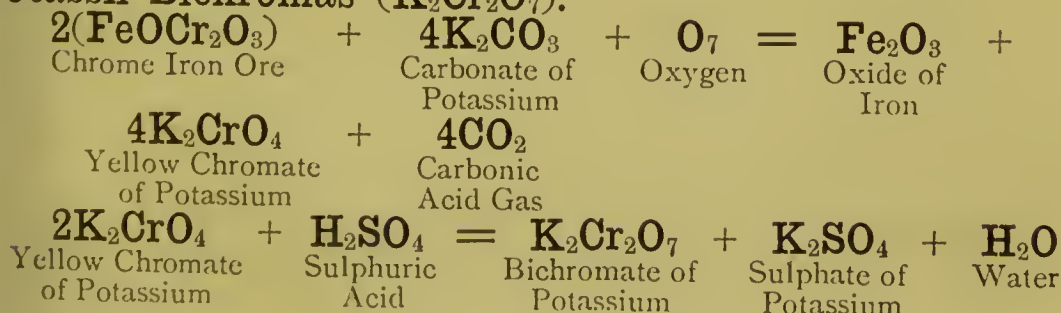
Bromum (Br).**Butyl-Chloral Hydras ($\text{C}_4\text{H}_5\text{Cl}_3\text{O}, \text{H}_2\text{O}$).****Calci Carbonas Præcipitata (CaCO_3).****Calci Chloridum ($\text{CaCl}_2\text{H}_2\text{O}$).****Calci Hydras (CaH_2O_2).****Calci Hypophosphis ($\text{Ca}_2\text{PH}_2\text{O}_2$).****Calci Phosphas ($\text{Ca}_3(\text{PO}_4)_2$).**

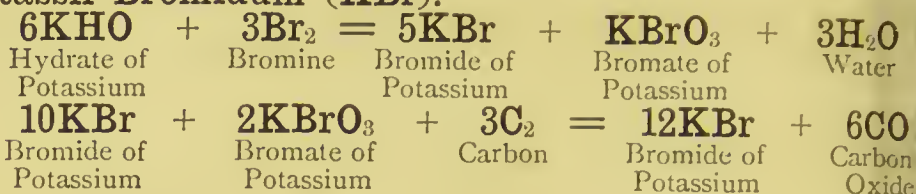
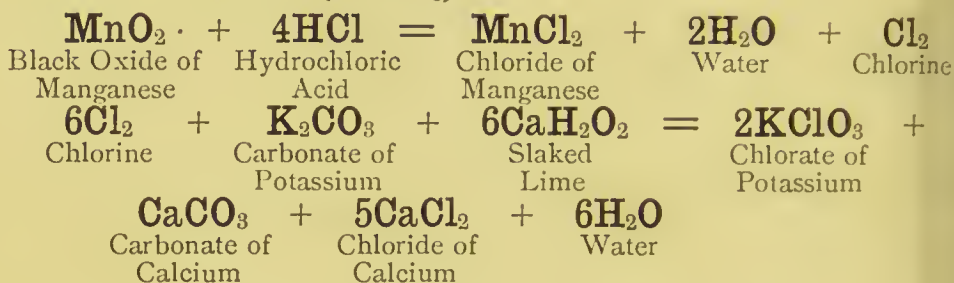
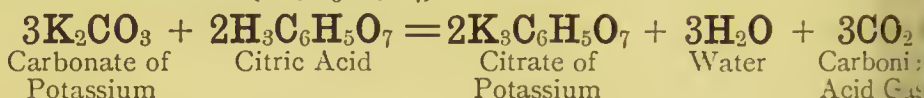
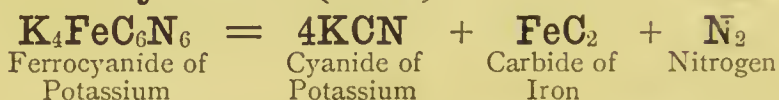
Calx (CaO).**Calx Chlorinata (CaCl₂, CaCl₂O₂).****Cerii Oxalas (CeC₂O₄·3H₂O).****Chloral Hydras (C₂HCl₃O, H₂O).****Chloroformum (CHCl₃).****Cupri Nitras (Cu(NO₃)₂·3H₂O).****Cupri Sulphas (CuSO₄·5H₂O).**

FERRIC SALTS—**Ferri Peroxidum Hydratum ($\text{Fe}_2\text{O}_2(\text{HO})_2$).****Ferri Acetatis Liquor Fortior.****Ferri Dialysatus Liquor.****Ferri Perchloridi Liquor Fortior (Fe_2Cl_6).****Ferri Pernitratis Liquor ($\text{Fe}_2\text{6NO}_3$).****Ferri Persulphatis Liquor ($\text{Fe}_2\text{3SO}_4$).****Ferrum Redactum (Fe and Fe_3O_4).**

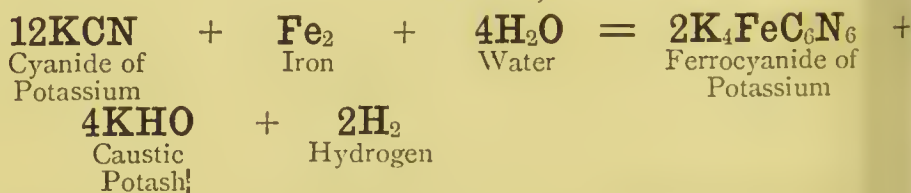
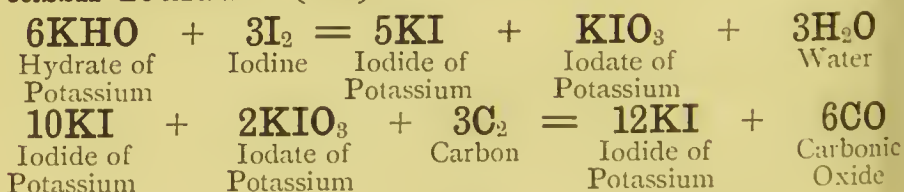
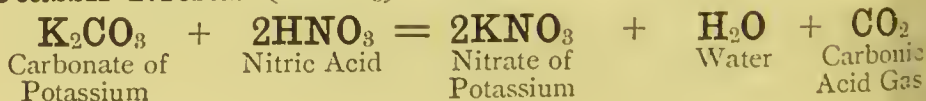
Ferrum Tartaratum.**FERROUS SALTS—****Ferri Arsenias ($\text{Fe}_3\text{As}_2\text{O}_8$).****Ferri Phosphas ($\text{Fe}_3\text{P}_2\text{O}_8$).****Ferri Sulphas ($\text{FeSO}_4, 7\text{H}_2\text{O}$); Ferri Sulphas Exsiccatus ($\text{FeSO}_4, \text{H}_2\text{O}$); Ferri Sulphas Granulata ($\text{FeSO}_4, 7\text{H}_2\text{O}$).****Glycerinum ($\text{C}_3\text{H}_5(\text{HO})_3$).****MERCURIC SALTS—****Hydrargyrum Ammoniatum (NH_2HgCl).****Hydrargyri Flava Lotio (HgO).**

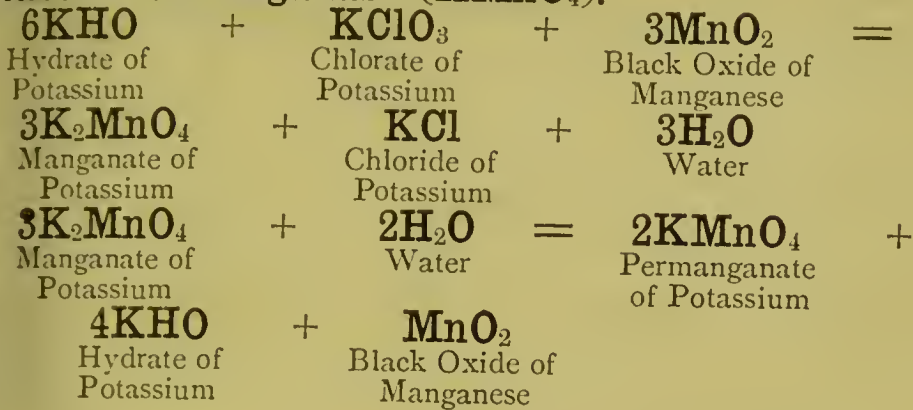
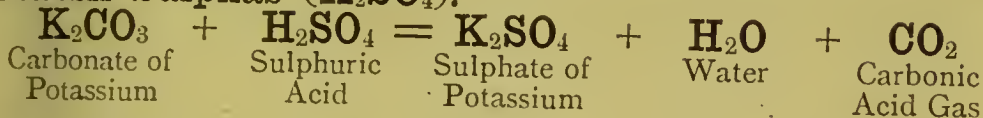
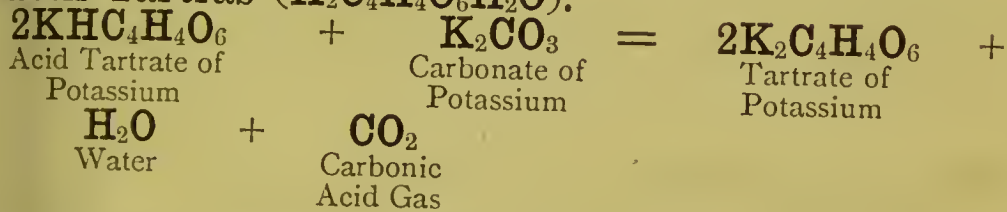
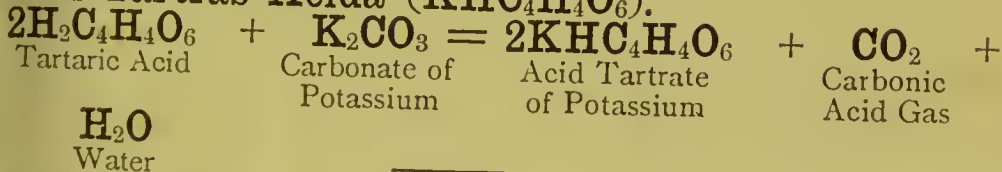
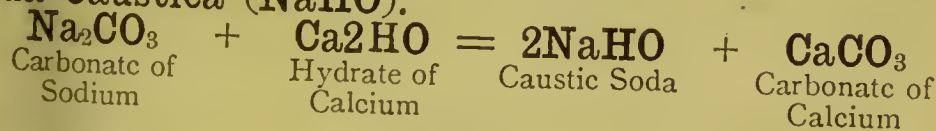
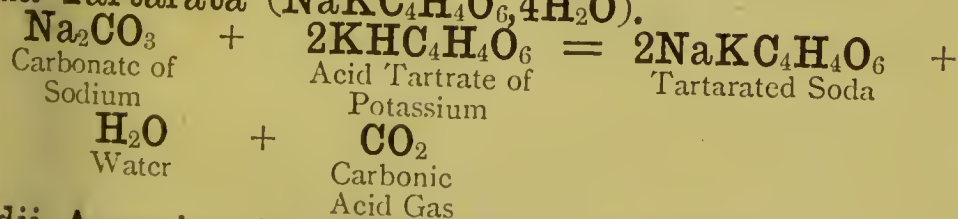
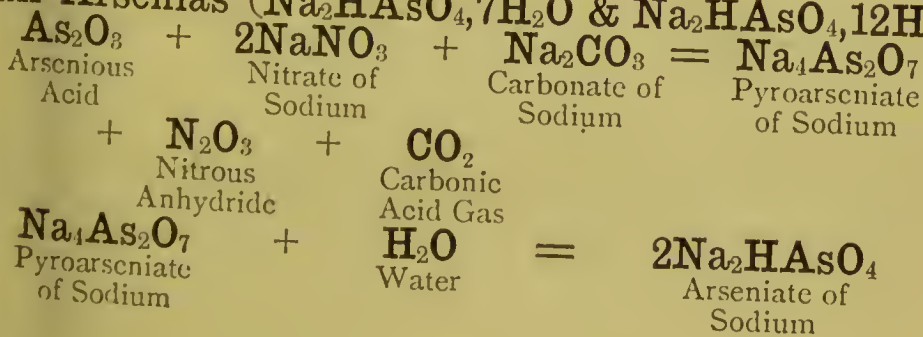
Hydrargyri Iodidum Rubrum (HgI₂).**Hydrargyri Nitratis Acidus Liquor (Hg₂NO₃).****Hydrargyri Oxidum Flavum (HgO).****Hydrargyri Oxidum Rubrum (HgO).****Hydrargyri Perchloridum (HgCl₂).****Hydrargyri Persulphas (HgSO₄).****MERCUROUS SALTS—****Hydrargyri Nigra Lotio (Hg₂O in water).****Hydrargyri Subchloridum (HgCl).****Iodoformum (CHI₃).**

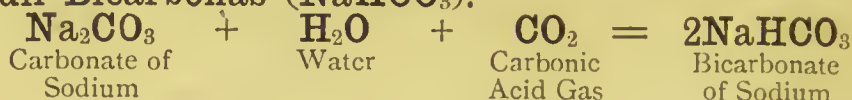
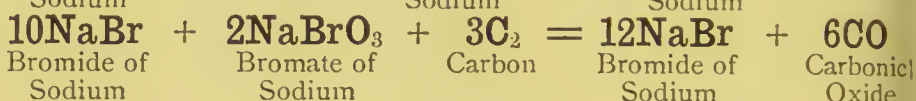
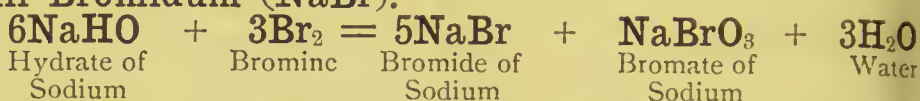
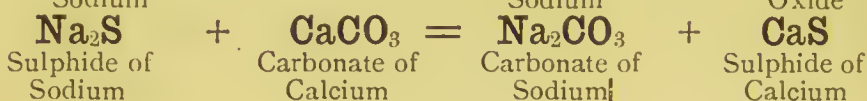
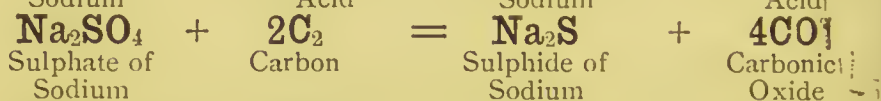
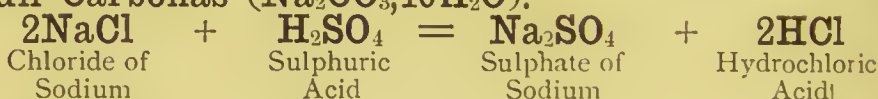
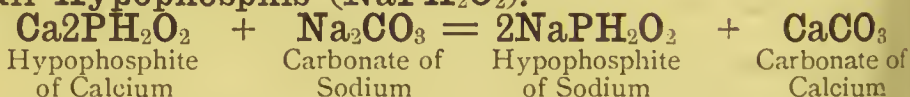
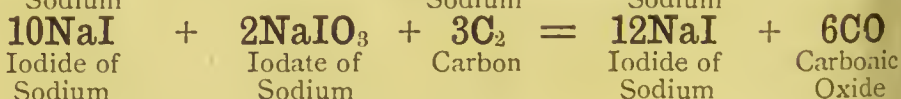
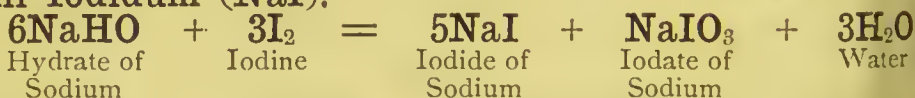
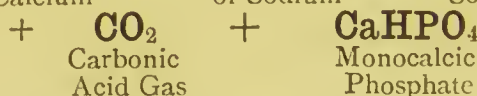
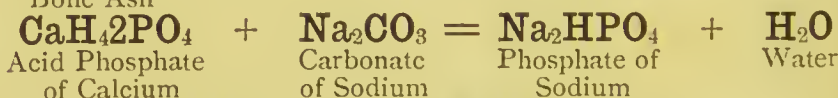
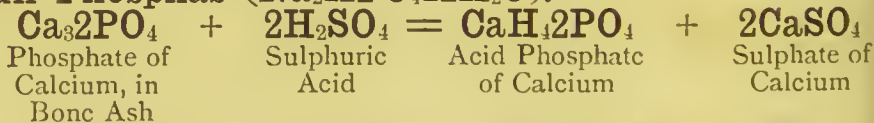
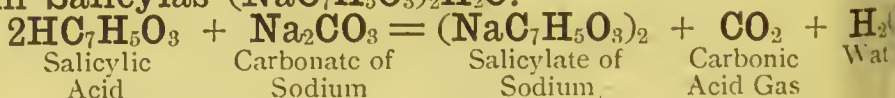
Plumbi Acetas ($\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}$).**Plumbi Subacetatis Liquor** ($\text{Pb}_2\text{C}_4\text{H}_6\text{O}_5$).**Plumbi Iodidum** (PbI_2).**Plumbi Nitras** (Pb2NO_3).**Plumbi Oxidum** (PbO).**Potassa Caustica** (KHO).**Potassa Sulphurata** ($\text{K}_2\text{S}_2\text{O}_3, 2\text{K}_2\text{S}_3$).**Potassii Acetas** ($\text{KC}_2\text{H}_3\text{O}_2$).**Potassii Bicarbonas** (KHCO_3).**Potassii Bichromas** ($\text{K}_2\text{Cr}_2\text{O}_7$).

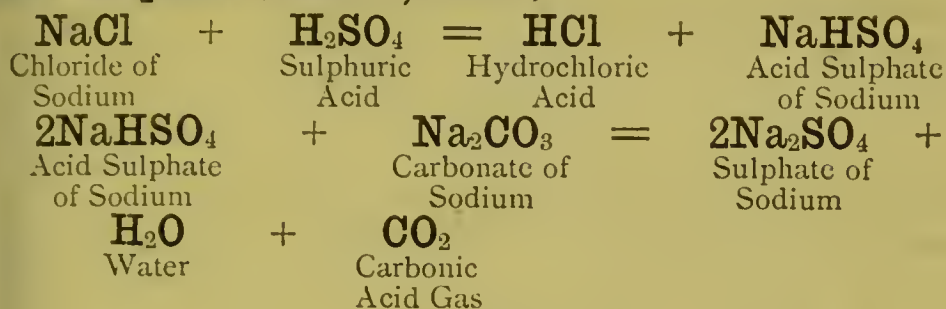
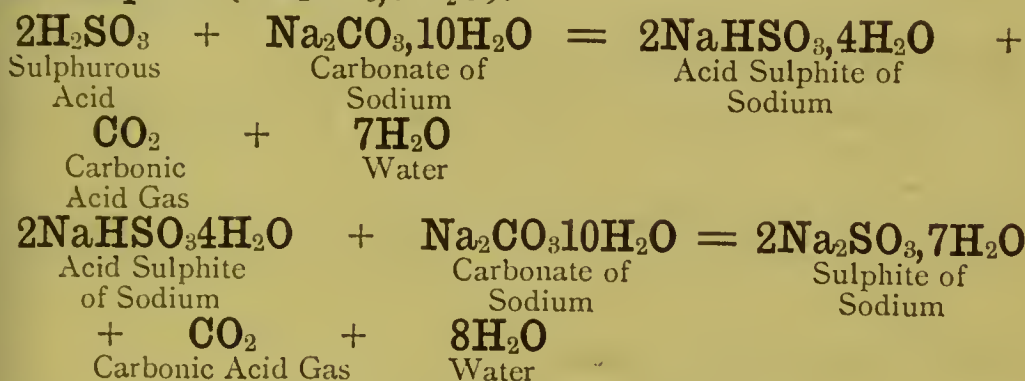
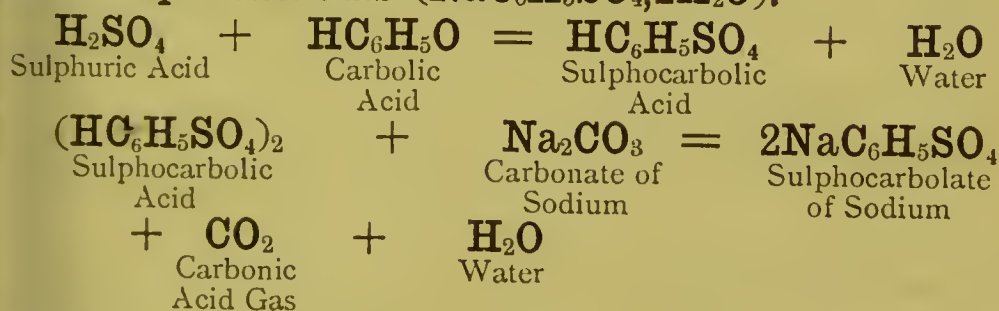
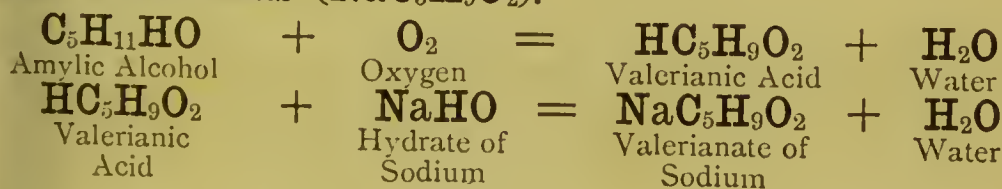
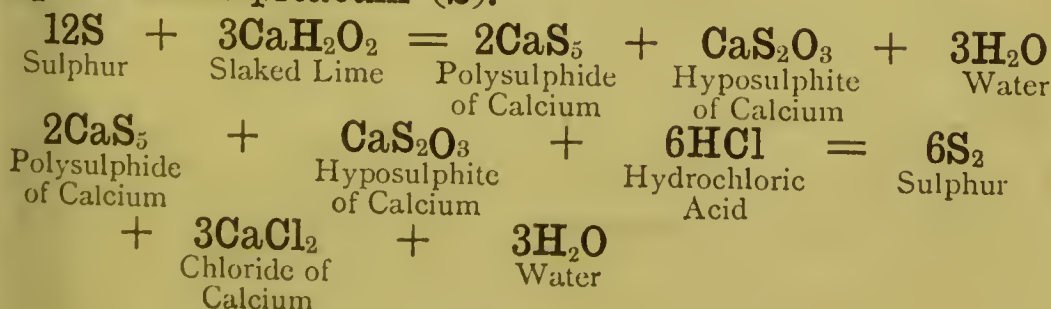
Potassii Bromidum (KBr).**Potassii Chloras (KClO₃).****Potassii Citras (K₃C₆H₅O₇).****Potassii Cyanidum (KCN).****Potassii Ferrocyanidum (K₄FeC₆N₆,3H₂O).**

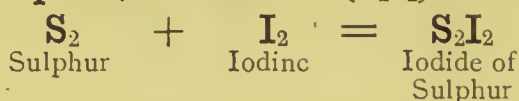
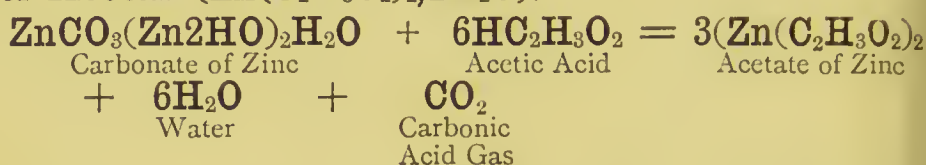
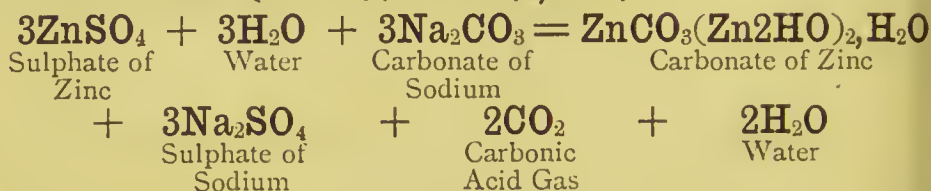
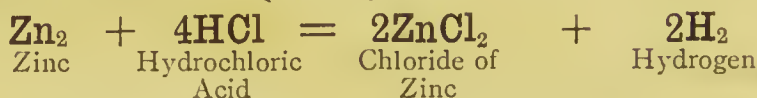
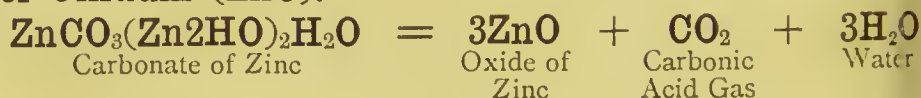
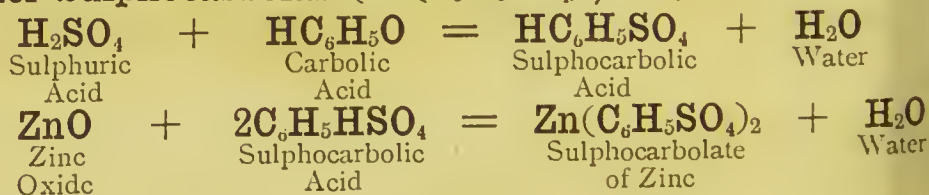
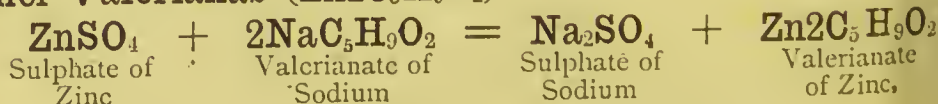
(Carbonate of Potassium and Nitrogen form, when fused, Cyanide of Potassium.)

**Potassii Iodidum (KI).****Potassii Nitras (KNO₃).**

Potassii Permanganas (KMnO_4).**Potassii Sulphas (K_2SO_4).****Potassii Tartras ($\text{K}_2\text{C}_4\text{H}_4\text{O}_6\cdot\text{H}_2\text{O}$).****Potassii Tartras Acidæ ($\text{KHC}_4\text{H}_4\text{O}_6$).****Soda Caustica (NaHO).****Soda Tartarata ($\text{NaKC}_4\text{H}_4\text{O}_6\cdot 4\text{H}_2\text{O}$).****Sodii Arsenias ($\text{Na}_2\text{HASO}_4\cdot 7\text{H}_2\text{O}$ & $\text{Na}_2\text{HASO}_4\cdot 12\text{H}_2\text{O}$).**

Sodii Bicarbonas (NaHCO_3).**Sodii Bromidum (NaBr).****Sodii Carbonas ($\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$).****Sodii Hypophosphis (NaPH_2O_2).****Sodii Iodidum (NaI).****Sodii Phosphas ($\text{Na}_2\text{HPO}_4, 12\text{H}_2\text{O}$).****Sodii Salicylas ($\text{NaC}_7\text{H}_5\text{O}_3, \text{H}_2\text{O}$).**

Sodii Sulphas ($\text{Na}_2\text{SO}_4, 10\text{H}_2\text{O}$).**Sodii Sulphis** ($\text{Na}_2\text{SO}_3, 7\text{H}_2\text{O}$).**Sodii Sulphocarbolas** ($\text{NaC}_6\text{H}_5\text{SO}_4, 2\text{H}_2\text{O}$).**Sodii Valerianas** ($\text{NaC}_5\text{H}_9\text{O}_2$).**Sulphur Præcipitatum** (S).

Sulphuris Iodidum (S_2I_2).**Zinci Acetas ($Zn(C_2H_3O_2)_2, 2H_2O$).****Zinci Carbonas ($ZnCO_3(Zn2HO)_2, H_2O$).****Zinci Chloridum ($ZnCl_2$).****Zinci Oxidum (ZnO).****Zinci Sulphas ($ZnSO_4, 7H_2O$).****Zinci Sulphocarbolas ($Zn(C_6H_5SO_4)_2, H_2O$).****Zinci Valerianas ($Zn2C_5H_9O_2$).**

OUTLINE OF THE B.P. VEGETABLE MATERIA MEDICA

(WITH THE NATURAL ORDERS ARRANGED ALPHABETICALLY FOR RAPID REFERENCE.)

Amyridaceæ or Burseraceæ

1. Balsamodendron Myrrha (Myrrh).

The gum-resin from the stem—Tincture 1 in 8; Pill of Aloes and Myrrh 1 in 6. Also enters into 1 Decoction, 1 Mixture, and 2 Pills.

2. Canarium commune? (Manila Elemi).

The concrete resinous exudation—Ointment 1 in 5.

Anacardiaceæ

Pistacia Lentiscus (Mastich).

The resin from the bark of the stem and large branches.

Apocynaceæ. (See Loganiaceæ.)

Aristolochiaceæ

1. Aristolochia Serpentaria, or
 2. Aristolochia reticulata
- } Serpentry or Snake Root.

The dried rhizome and rootlets—Infusion 1 in 40; Tincture 1 in 8.

Enters into Compound Tincture of Cinchona.

Asclepiadaceæ

Hemidesmus indicus (Indian Sarsaparilla).

The dried root—Syrup 1 in 8.

Aurantiaceæ

1. Citrus vulgaris or Citrus Bigaradia (Bitter Orange).

The ripe fruit, *fresh* rind—Wine. Tincture of *fresh* peel 6 oz. to 1 pint.

The *dried* outer part of the rind, Infusion 1 in 20; Compound Infusion 1 in 40; Tincture 1 in 10; Syrup 1 in 8.

The fresh flowers—Orange-flower Water. Syrup 1 in $6\frac{3}{4}$.

2. Citrus Aurantium (Sweet Orange).

The fresh flowers—Orange-flower Water. Syrup 1 in $6\frac{3}{4}$.

In addition, Orange-peel or its preparations enters into 3 Tinctures, 2 Wines, 1 Infusion, 1 Spirit, 1 Mixture, and 1 Confection.

3. Citrus Limonum (Lemon).

The outer part of the rind of the *fresh* fruit—Tincture 1 in 8.

The oil from the same—Enters into 1 Liniment and 1 Spirit.

The freshly expressed juice of the ripe fruit—Syrup. Citric Acid.

4. Citrus Bergamia or C. Limetta (The Lime).

Used as a source of Citric Acid.

5. Ægle Marmelos (Bael).

The dried half-ripe fruit—Liquid Extract 1 in 1.

Berberidaceæ

Podophyllum peltatum (May Apple).

The dried rhizome and rootlets—Resin, and Tincture 1 in 60. (This is also classed under Ranunculaceæ.)

Burseraceæ. (See Amyridaceæ.)

Camelliaceæ or Ternstroemiaceæ

Camellia Thea (Tea Plant).

The dried leaves—Caffeine and Citrate of Caffeine.

Cannabinaceæ

1. Cannabis sativa (Indian Hemp).

The dried flowering or fruiting tops of the female plants grown in India, and from which the resin has not been removed.

Extract; and Tincture 1 in 20.

2. Humulus Lupulus (Hop).

The dried strobiles from plants cultivated in England.

Lupulin, Extract, Infusion, 1 in 20; Tincture 1 in 8.

Canellaceæ

Canella alba (Canella or Wild Cinnamon).

The bark deprived of its corky layer and dried—Enters into Rhubarb Wine.

Caprifoliaceæ

Sambucus nigra (Elder).

The fresh flowers of indigenous plants—Water 10 lbs. to 1 gallon.

Celastraceæ

Euonymus atropurpureus (Wahoo).

The *dry* extract from the root bark.**Cinchonaceæ or Rubiaceæ**

1. Cephaelis Ipecacuanha (Ipecacuanha or Hippos).

The dried root—Wine 1 in 20; Acetum 1 in 20; Lozenge $\frac{1}{4}$ gr. in each; Lozenge of I. and Morphine $\frac{1}{12}$ gr. each; Compound Powder 1 in 10; I. and Squill Pill, 1 in 23. Enters into Compound Hemlock Pill.

2. Cinchona Calisaya (Yellow Cinchona).

3. Cinchona lancifolia (Coquetta Cinchona).

4. Cinchona officinalis (Pale Cinchona).


5. Other species of Cinchona.

The dried bark of any of the above may be used for obtaining Sulphates of Cinchonidine, Cinchonine, and Quinine, and Hydrochlorate of Quinine.

6. Some species of Remijia, DC., may be used for obtaining the Salts of Quinine and Cinchonine.

7. Cinchona succirubra (Red Cinchona).

The dried bark of the stem and branches of cultivated plants.

Decoction $1\frac{1}{4}$ oz. to 1 pint; Liquid Extract 1 in 1; Acid Infusion 1 in 20; Tincture 1 in 5; Compound Tincture 1 in 10. It also enters into Aromatic Iron Mixture. In all the Galenical preparations the *red* bark only is permitted, and it may also be used as the source of Quinine, Cinchonine, and Cinchonidine Salts. Quinine enters into 2 Tinctures, 1 Wine, and 1 Scale Preparation.

8. Coffea arabica (Coffee).

The dried seeds, used for obtaining Caffeine and its Citrate.

9. Uncaria Gambier (Catechu or Pale Catechu).

An extract of the leaves and young shoots—Infusion 16 grs. to 1 oz.; Tincture 1 in 8; Lozenge 1 gr. in each; Compound Powder 1 in $2\frac{1}{2}$.**Compositæ**

1. Anacyclus Pyrethrum (Pellitory).

The dried root—Tincture 1 in 5.

Lettuce radish (the) washed & dried with an onion /

2. *Anthemis nobilis* (Chamomile).

The dried single and double flower heads or capitula from cultivated plants.
Extract, Infusion 1 in 20, and Oil.

3. *Arnica montana* (Arnica).

The dried rhizome and rootlets—Tincture 1 in 20.

4. *Artemisia maritima*, *var.* *Stechmanniana*, or *A. pauciflora* (Santonica).

The dried unexpanded flower heads, or capitula, yielding Santonin. Lozenges 1 gr. in each.

5. *Lactuca virosa* (Lettuce).

The flowering herb—Extract.

6. *Taraxacum officinale* or *T. Dens-leonis* (Dandelion).

(a) The *fresh* roots collected in autumn from indigenous plants—Extract.

(b) The *juice* from the above.

(c) The *dried* roots collected in autumn from indigenous plants—Liquid Extract 1 in 1; Decoction 1 in 20.

Coniferæ

1. *Juniperus communis* (Juniper).

The oil distilled in Britain from the full-grown unripe green fruit.
Spirit 1 in 50. Enters into Creasote Mixture.

2. *Juniperus Sabina* (Savin).

(a) The *fresh* tops collected in spring from plants cultivated in Britain.
Ointment 8 to 19.

(b) The tops collected as above and *dried*.
Tincture 1 in 8.

(c) The oil distilled in Britain from the fresh tops.

3. *Juniperus Oxycedrus* and some other species.

The oily liquid (**Oil of Cade**) obtained by the destructive distillation of the woody portions.

4. *Pinus australis* or *palustris* (Pitch Pine).5. *Pinus Pinaster* (Cluster Pine).6. *Pinus sylvestris* (Scotch Fir).7. *Pinus Tæda* (Frankincense Pine).

(a) The distilled and rectified oil (**Oil of Turpentine**) from the Oleo-Resin (Turpentine) obtained from any of the above four pines.
Confection 1 in 4; Enema 1 in 16; Liniment 16 in 21; Acetic Liniment 4 in 9; Ointment 1 in 2.

(b) The residue (**Resin**) left after the distillation of the above.
Plaster 1 in 9½; Ointment 1 in 4.

Also enters into 7 plasters, Turpentine Ointment and Blistering Paper.

(c) A bituminous liquid (**Tar**) obtained from the wood of *P. sylvestris* and other species by destructive distillation.—Ointment 5 in 7.

(d) The Concrete Turpentine (**Common Frankincense**) scraped off the trunks of *P. australis* and *P. Tæda*. Enters into Pitch Plaster.

(e) The oil (**Fir-wool Oil**) distilled from the fresh leaves of the *P. sylvestris*.
Inhalation 5 minims.

8. *Pinus balsamea* or *Abies balsamea* (Balsam Fir).

The oleo-resin or Turpentine (**Canada Balsam**) obtained by puncturing or incising the bark of the trunk and branches.
Enters into Blistering Paper and Flexible Collodion.

9. *Pinus Larix* or *Abies Larix* (Larch).

The bark collected in spring deprived of its rough exterior and dried.
Tincture 1 in 8.

10. *Pinus Picea* or *P. Abies* or *A. excelsa* (Spruce).

The resinous exudation (**Burgundy Pitch**) from the stem, melted and strained—Enters into Pitch Plaster 1 in 2, and Iron Plaster 2 in 11.

Convolvulaceæ1. *Convolvulus Scammonia* (Scammony).

(a) The gum-resinous exudation, hardened in the air, obtained by incising the living root—Mixture 3 grs. in 1 oz., and Resin.

(b) The dried root, from which the resin is chiefly made, which enters into Confection 1 in 3; Compound Pill 1 in 3; Compound Powder 1 in 2; Compound Pill and Extract of *Colocynth*.

2. *Ipomœa Purga* or *Exogonium Purga* (Jalap).

The dried tubercles—Extract, Tincture 1 in 8; Compound Powder 1 in 3; Compound Scammony Powder 3 in 8; and Resin, which enters into Compound Scammony Pill.

Cruciferæ1. *Brassica alba* or *Sinapis alba* (White Mustard).

The dried ripe seeds from plants cultivated in Britain.

2. *Brassica nigra* or *Sinapis nigra* (Black Mustard).

The dried ripe seeds from plants cultivated in Britain.

Volatile Oil, and Compound Liniment, 1 in 38; *Sinapis*—the powdered seeds of white and black mustard mixed. Cataplasm 1 in 6; Charta.

3. *Cochlearia Armoracia* (Horseradish).

The fresh roots from British plants—Compound Spirit 1 in 8.

Cucurbitaceæ1. *Citrullus Colocynthis* (*Colocynth* or Bitter Apple).

The dried peeled fruit freed from seeds—Compound Pill 1 in 6; Compound Pill with *Hyoscyamus* 1 in 9; Compound Extract 1 in 4½.

2. *Ecballium Elaterium* (Squirting Cucumber).

The very nearly ripe fruit—*Elaterium* (the sediment from the juice), *Elaterin* (the active principle of *Elaterium*), Compound Powder 1 in 40.

Cupuliferæ or Corylaceæ1. *Quercûs lusitanica* var. *infectoria*, or *Q. infectoria*.

Excrescences caused by the puncture and deposit of the eggs of *Cynips Gallæ tinctoriæ*—Tincture 1 in 8; Ointment 80 grs. to 1 oz.; Ointment with Opium 80 grs. to 1 oz.; Gallic and Tannic Acids and their preparations.

2. *Quercûs Robur* or *Q. pedunculata* (Common Oak).

The dried bark of the smaller branches and young stems collected in spring from trees growing in Britain—Decoction 1¼ in 20.

Ericaceæ*Arctostaphylos Uva-ursi* (Bearberry).

The dried leaves of indigenous plants—Infusion 1 in 20.

Erythroxylaceæ*Erythroxylon Coca* (Coca Plant).

The dried leaves.

Liquid Extract 1 in 1; Hydrochlorate of Cocaine; Discs $\frac{1}{200}$ gr. in each.

Euphorbiaceæ*Croton Klean-like (Castor Oil Plant)*

1. *Croton Eluteria* (Cascarilla).

The dried bark—Infusion 1 in 10; Tincture 1 in 8.

2. *Croton Tiglium* (Purging Croton).

The oil expressed from the seeds in Britain—Liniment 1 in 8.

3. *Mallotus philippinensis* or *Rottlera tinctoria* (Kamala).

The glands and hairs from the surface of the fruits.

4. *Ricinus communis* (Castor Oil Plant).

The oil expressed from the seeds—Mixture 3 in 8.

Enters into 1 Collodion, 1 Liniment, and 1 Pill.

Filices

Aspidium Filix-mas (Male Fern).

The rhizome with the persistent bases of the petioles, collected late in autumn, divested of its scales, roots, and all dead matter, and carefully dried with a gentle heat—Liquid Extract.

Fungi

1. *Claviceps purpurea* (Ergot).

The sclerotium (mycelium or spawn) produced between the pales and replacing the grain of *Secale cereale* (Common Rye).

Ergotin, and Hypodermic Injection 1 in 3; Liquid Extract 1 in 1; Infusion 1 in 40; Tincture 1 in 4.

2. *Saccharomyces* (*Torula*) *cerevisiæ* (Yeast Plant).

The ferment obtained in brewing beer and produced by the above.

Poultice 1 in $4\frac{1}{3}$.

Gentianaceæ

1. *Gentiana lutea* (Gentian).

The dried root—Extract, Compound Infusion 100 grs. to 1 pint; Compound Tincture $1\frac{1}{2}$ oz. to 1 pint.

2. *Ophelia Chirata* or *Gentiana Chirata* (Chiretta).

The dried plant, collected when the fruit begins to form.

Infusion 1 in 40; Tincture 1 in 8.

Graminaceæ

1. *Hordeum distichon* (Barley).

The dried seed divested of its integuments from plants cultivated in Britain.

Decoction 1 in 10.

2. *Oryza sativa* (Rice).

Used as a source of Starch.

3. *Secale cereale* (Common Rye).

The spawn of the fungus (*Claviceps purpurea*) growing between the pales and replacing the grain. See Fungi.

4. *Triticum sativum* or *T. vulgare* (Wheat).

The grain ground and sifted.

Used in Yeast Poultice, and as a source of Starch, and in Bread Crumb and Charcoal Poultices.

5. *Zea Mays* (Maize or Indian Corn).

Used as a source of Starch.

Guttiferæ

Garcinia Hanburii or *Garcinia Morella* var. *pedicellata* (Gamboge).

The gum-resin—Compound Pill 1 in 6.

Hamamelidaceæ

Hamamelis virginica (Witch Hazel).

The dried bark—Tincture 1 in 10.

The dried leaves—Liquid Extract 1 in 1; Ointment 1 in 10.

Iridaceæ

Crocus sativus (Saffron).

The dried stigmas and top of the style—Tincture 1 in 20.

Enters into 1 Decoction, 1 Pill, 1 Powder, and 3 Tinctures.

Labiataæ

1. *Lavandula vera* (Lavender).

The oil distilled in Britain from the flowers—Spirit 1 in 50; Compound Tincture 45 minims to 1 pint. Enters into 1 Liquor and 1 Liniment.

2. *Mentha arvensis* vars. *piperascens* et *glabrata*.

The oil distilled from the fresh herb is used as a source of Menthol.

3. *Mentha piperita* (Peppermint).

The oil distilled in Britain from the fresh flowering herb.

Water $1\frac{1}{2}$ dr. to 1 gallon; Essence 1 in 5; Spirit 1 in 50, and Menthol Enters into 1 Mixture, 1 Pill, and 1 Tincture.

4. *Mentha viridis* (Spearmint).

The oil distilled in Britain from the fresh flowering herb.

Water $1\frac{1}{2}$ dr. to 1 gallon.

5. *Monarda punctata* (Horsemint).

The volatile oil—used as a source of Thymol.

6. *Rosmarinus officinalis* (Rosemary).

The oil distilled from the flowering tops—Spirit 1 in 50.

Enters into Soap Liniment and Compound Tincture of Lavender.

7. *Thymus vulgaris* (Garden Thyme).

The volatile oil—used as a source of Thymol.

Lauraceæ

1. *Cinnamomum Camphora* or *C. officinarum* (Camphor).

A stearoptene obtained from the wood.

Water $\frac{1}{2}$ gr. in 1 oz.; Liniment 1 in 5; Compound Liniment 1 in 9; Spirit 1 in 10; Compound Tincture $1\frac{1}{2}$ grs. in 1 oz.

Also enters into 1 Liquor, 2 Injections, 1 Ointment, and 11 Liniments.

2. *Cinnamomum zeylanicum* (Ceylon Cinnamon).

The dried inner bark of shoots from the truncated stocks of the cultivated tree from Ceylon—Oil; Spirit 1 in 50; Water 1 in 8; Tincture 1 in 8.

Cinnamon or its preparations also enters into 3 Mixtures, 2 Pills, 5 Powders, 4 Tinctures, 1 Acid, 1 Decoction, 1 Infusion, and 1 Wine.

3. *Nectandra Rodiæi* (*Nectandra* or *Bebeeru*).

The dried bark—yielding Sulphate of Beberine.

4. *Sassafras officinale* (Sassafras).

The dried root reduced to chips or shavings.

Enters into Compound Decoction of Sarsaparilla.

Leguminosæ

1. *Acacia Senegal* or *A. Verek* and other species (*Acacia*).

A gummy exudation from the stems and branches.

Mucilage 4 and 6. Enters into 2 Mixtures, 2 Powders, and all the Lozenges.

2. *Andira araroba* (*Chrysarobin* or *Araroba*).

The medullary matter of the stem and branches—Ointment 1 in 25.

3. *Astragalus gummifer* (Tragacanth).

A gummy exudation from the stem.

Glycerine 1 in 5½; Compound Powder 1 in 6; Mucilage 60 grs. to 10 ozs.

Also enters into 1 Compound Powder and 2 Confections.

4. *Cassia acutifolia* or *C. lanceolata* (Alexandrian Senna).5. *Cassia angustifolia* or *C. elongata* (East Indian Senna).

The dried leaflets.

Confection 1 in 11; Infusion 1 in 10; Syrup 1 in 2; Tincture 1 in 8; Co. Mixture 1 in 8. Also enters into Compound Liquorice Powder.

6. *Cassia Fistula* (Purging Cassia).

The pulp from the pods. Enters into Confection of Senna.

7. *Copaifera Langsdorffii* (Copaiba or Copaiva).

The oleo-resin from the trunk, and the oil distilled from it.

8. *Cytisus scoparius* or *Sarothamnus scoparius* (Broom).

The *fresh* and *dried* tops—Decoction 1 in 20 (dried tops).

The juice from the fresh tops.

9. *Glycyrrhiza glabra* (Liquorice).

The root and stolons, fresh and dried—Extract, Liquid Extract 1 in 2; Compound Powder 1 in 6. Also enters into 1 Mixture, 2 Decoctions, 2 Tinctures, 2 Confections, 1 Infusion, 2 Pills, and 1 Lozenge.

10. *Hæmatoxylon campechianum* (Logwood).

The sliced heart-wood—Extract, and Decoction 1 in 20.

11. *Myroxylon Pereiræ* or *Toluifera Balsamum* (Peru).

A balsam exuding from the trunk after removal of the bark.

12. *Myroxylon Toluifera* or *Toluifera Balsamum* (Tolu).

A balsam exuding from the trunk—Tincture 1 in 8; Syrup 1 in 29. Enters into 1 Pill, 1 Compound Tincture, and 4 Lozenges.

13. *Physostigma venenosum* (Calabar Bean).

The dried seed—Extract, Physostigmine or Eserine and Discs, $\frac{1}{1000}$ gr.

14. *Pterocarpus Marsupium* (Kino).

The inspissated juice from the trunk—Tincture 1 in 10; Compound Powder 3 in 4. Enters into Compound Catechu Powder.

15. *Pterocarpus santalinus* (Red Sandal or Sanders Wood).

The rasped or sliced heart-wood. Enters into Compound Tincture of Lavender.

16. *Tamarindus indica* (Tamarind).

The preserved pulp of the fruit: Enters into Confection of Senna.

Lichenes1. *Cetraria islandica* (Iceland Moss).

The dried lichen—Decoction 1 in 20.

2. *Roccella*—various species—(Dyer's weed or Litmus).

Solution and Papers, introduced into B.P. Appendix for testing.

Liliaceæ1. *Aloe vulgaris* (Barbadoes or Curaçoa Aloes).

The juice when inspissated which flows from the transversely cut bases of the leaves, imported from Barbadoes and the Dutch West Indies.

Aloin; Extract; Enema 4 grs. in 1 oz.; Pill 1 in 2; Pill with Iron 1 in 5½; Gamboge Pill 1 in 6; Colocynth Pill 1 in 3; do. with Hyoscyamus 1 in 4½.

2. *Aloe Perryi*, and probably other species (Socotrine Aloes).

The inspissated juice from the bases of the leaves, imported by way of Bombay and Zanzibar.

Aloin ; Extract ; Enema 4 grs. in 1 oz. ; Decoction 4 grs. in 1 oz. ; Tincture 11 grs. to 1 oz. ; Wine 16½ grs. to 1 oz. ; Compound Extract of Colocynth 1 in 2½ ; Pill 1 in 2 ; Rhubarb Pill, 1 in 6 ; Pill with Asafoetida 1 in 4 ; Pill with Myrrh 1 in 3 ; Friar's Balsam 1 in 60.

3. *Urginea Scilla* (Squill).

The bulb divested of its outer scales sliced and dried.

Acetum 1 in 8 ; Oxy-mel ; Syrup 1 in 17 ; Tincture 1 in 8 ; Compound Pill 1 in 5 ; Pill with Ipecac. 1 in 7.

Linaceæ

Linum usitatissimum (Flax).

The dried ripe seeds—Oil. Infusion 15 grs. to 1 oz.

The dried ripe seeds powdered (Linsced Meal). Enters into 5 Poultices.

Erythroxyton Coca is sometimes classed under this order. See *Erythroxy-laceæ*.

Liquidambaraceæ or Altingiaceæ

Liquidambar orientalis (Storax Tree).

A balsam prepared from the inner bark—Enters into Friar's Balsam.

Storax has been placed also under the *Styracaceæ*, *Balsamifloræ*, and *Hamamelidaceæ*, which latter order is often made to include the *Liquidambaraceæ*.

Lobeliaceæ

Lobelia inflata (Lobelia).

The dried flowering herb—Tincture 1 in 8 ; Ethereal Tincture 1 in 8.

Loganiaceæ or Apocynaceæ

1. *Gelsemium nitidum* or *G. sempervirens* (Yellow Jasmine).

The dried rhizome and rootlets—Tincture 1 in 8, and Alcoholic Extract.

2. *Strophanthus hispidus* (The Kombé).

The mature ripe seeds freed from the awns—Tincture 1 in 20.

3. *Strychnos Nux-vomica* (Nux Vomica).

The seeds—Extract 15 per cent. Alkaloids ; Tincture 1 gr. Alkaloids in 1 oz. ; Strychnine ; and Solution of Strychnine 1 per cent.

Magnoliaceæ

Illicium anisatum (Star-Anise).

The dried fruit from plants cultivated in China.

Volatile Oil, and Essence 1 in 5.

Malvaceæ

Gossypium barbadense (Cotton).

The hairs of the seed—Cotton Wool.

Enters into Pyroxylin, which enters into 3 Collodions.

Melanthaceæ

1. *Colchicum autumnale* (Meadow Saffron).

(a) The fresh corm collected at the end of June or beginning of July.

Extract and Acetic Extract.

(b) The corm stripped of its coats, sliced and dried under 150°.

Wine 1 in 5.

(c) The seeds collected in July or August when fully ripe, and carefully dried—Tincture 1 in 8.

2. *Schoenocaulon officinale* or *Asagraea officinalis* (Sabadilla or Cevadilla).

The dried ripe seeds—Used for obtaining Veratrine.

Ointment of Veratrine 7 grs. to 1 oz.

3. *Veratrum viride* (Green Hellebore).

The dried rhizome and rootlets—Tincture 1 in 5.

Menispermaceæ

1. *Anamirta paniculata* (*Cocculus indicus*).

Picrotoxin—An Alkaloid from the seeds.

2. *Chondrodendron tomentosum* (Pareira).

The dried root.

Extract, Liquid Extract 1 in 4 (of Extract). Decoction 1 in 16.

3. *Jateorhiza Calumba* or *Cocculus Palmatus* (Calumba).

The dried root, sliced—Extract; Infusion 1 in 20; Tincture 1 in 8.

Enters into Aromatic Iron Mixture.

Moraceæ (Sometimes regarded as a sub-order of Urticaceæ).

1. *Ficus Carica* (Fig).

The dried fruit—Enters into Confection of Senna.

2. *Morus nigra* (Mulberry).

The juice of the ripe fruit—Syrup 1 in 2.

Myristicaceæ

Myristica fragrans or *M. officinalis* (Nutmeg).

The dried seed divested of its hard coat or shell.

Oil, Expressed Oil, and Spirit 1 in 50.

Enters into 2 Powders, 2 Spirits, 1 Pill, 1 Tincture, 1 Mixture, and 2 Plasters.

Myrtaceæ

1. *Eucalyptus Globulus* (*Eucalyptus* or Blue Gum).

2. *Eucalyptus amygdalina* and probably other species.

The oil distilled from the fresh leaves—Ointment 1 in 5.

3. *Eucalyptus rostrata* (Red Gum) and other species.

The ruby exudation from the bark.

4. *Eugenia caryophyllata* or *C. aromaticus* (Clove).

The dried flower-bud—Oil, Infusion 1 in 40. Also enters into 1 Infusion, 1 Wine, 1 Mixture, 1 Confection, 2 Powders, and 2 Pills.

5. *Melaleuca minor* or *Melaleuca Cajuputi* (Cajuput).

The oil distilled from the leaves.

Spirit 1 in 50. Enters into Croton Liniment.

6. *Pimenta officinalis* or *Eugenia Pimenta* (Pimento).

The dried unripe full-grown fruit—Water 14 ozs. to 1 gallon, and Oil.

7. *Punica Granatum* (Pomegranate).

The dried bark of the root—Decoction 2 ozs. to 1 pint.

Oleaceæ

1. *Fraxinus Ornus* (Manna Ash).

The concrete saccharine exudation from transverse incisions in the stems of cultivated trees.

2. *Olea europæa* (Olive).

The oil expressed from the ripe fruit.

Enters into 1 Enema, 1 Paper, 2 Soaps, 3 Liniments, 4 Ointments, and 5 Plasters.

Papaveraceæ

1. *Papaver somniferum* (White or Opium Poppy).

The nearly ripe dried capsules from British plants.

Decoction 1 in 10; Extract; Syrup 1 to 3.

Opium—the inspissated juice from the unripe capsules.

2. *Papaver Rhœas* (Red Poppy).

The fresh petals from indigenous plants. Syrup 1 in 3½.

Piperaceæ

1. *Piper angustifolium* or *Artanthe elongata* (Matico).

The dried leaves—Infusion 1 in 20.

2. *Piper Cubeba* or *Cubeba officinalis* (Cubebs).

The dried unripe full-grown fruit—Oleo-resin, Oil, and Tincture 1 in 8.

3. *Piper nigrum* (Black Pepper).

The dried unripe fruit—Confection 1 in 10.

Enters into Compound Powder and Confection of Opium.

Polygalaceæ

1. *Krameria Ixina*, var. *granatensis*, Triana (*Krameria tomentosa*) (Savanilla Rhatany).

2. *Krameria triandra* (Peruvian Rhatany).

The dried root—Extract, Infusion 1 in 20; Tincture 1 in 8.

Enters into Compound Catechu Powder.

3. *Polygala Senega* (Senega Snake Root).

The dried root—Infusion 1 in 20; Tincture 1 in 8.

Polygonaceæ

1. *Rheum officinale*.

2. *Rheum palmatum*.

3. Probably other species.

} Rhubarb.

The root deprived of bark, sliced and dried in China and Thibet.

Extract; Infusion 1 in 40; Syrup 1 in 15; Tincture 1 in 10; Wine 1 in 13½;

Compound Pill 1 in 4; and Compound Powder 1 in 4½.

Ranunculaceæ

1. *Aconitum Napellus* (Monkshood).

The fresh leaves and flowering tops—Extract.

The dried root—Liniment 1 in 1½; Tincture 1 in 8; and Aconitina.

2. *Cimicifuga racemosa* or *Actæa r.* (Black Snake root).

Dried rhizome and rootlets—Liquid Extract 1 in 1; and Tincture 1 in 8.

3. *Delphinium Staphisagria* (Stavesacre).

The dried ripe seeds—Ointment 10 per c. oil.

4. *Hydrastis canadensis* (Golden Seal).

The dried rhizome and rootlets—Liquid Extract 1 in 1; Tincture 1 in 10.

5. *Podophyllum peltatum* (May Apple).

The dried rhizome and rootlets—Resin, and Tincture 1 in 60.

Rhamnaceæ

1. *Rhamnus Frangula* (Frangula or Black Alder).

The dried bark—Extract, and Liquid Extract 1 in 1.

2. *Rhamnus Purshianus* (Cascara Sagrada).

The dried bark—Extract, and Liquid Extract 1 in 1.

Rosaceæ

1. *Hagenia abyssinica* or *Brayera anthelmintica* (Kousso).
The dried panicles, chiefly of the female flowers—Infusion $\frac{1}{4}$ oz. to 4 ozs.
2. *Prunus Amygdalus* or *Amygdalus communis* *var.* *amara* (Bitter Almond).
The ripe seed—Yields by expression the Oil.
3. *Prunus Amygdalus* or *Amygdalus communis* *var.* *dulcis* (Sweet or Jordan Almond).
The ripe seed—Yields by expression the Oil, which enters into Simple, Spermaceti, and Resin Ointments, and Phosphorated Oil.
Mixture 1 in 8 ; Compound Powder 8 in 13.
4. *Prunus domestica* *var.* *Juliana* (Prune).
The dried drupe from Southern France. In Confection of Senna.
5. *Prunus Laurocerasus* (Cherry-Laurel).
The fresh leaves—The water 1 per cent. of HCN.
6. *Rosa canina* (Dog-Rose).
The ripe fruit or hips—Confection 1 in 3.
7. *Rosa centifolia* (Cabbage-Rose).
The fresh fully-expanded petals cultivated in Britain.
Water 1 in 1. Enters into 1 Lozenge and 1 Mixture.
8. *Rosa gallica* (Red-Rose).
The fresh and dried unexpanded petals cultivated in Britain.
Acid Infusion 1 in 40 ; Confection 1 in 4 ; Syrup 1 in 17.
The Confection enters into 7 Pills.

Rubiaceæ. (See Cinchonaceæ.)**Rutaceæ**

1. *Barosma betulina* ; 2. *B. crenulata* ; 3. *B. serratifolia* (Buchu).
The dried leaves—Infusion 1 in 20 ; Tincture 1 in 8.
4. *Galipea Cusparia* (Cusparia or Angustura).
The dried bark—Infusion 1 in 20.
5. *Pilocarpus pennatifolius* (Jaborandi).
The dried leaflets—Extract ; Infusion 1 in 20 ; Tincture 1 in 4 ; Pilocarpine.
6. *Ruta graveolens* (Rue).
The oil distilled from the fresh herb.

Salicaceæ

1. *Salix alba* (White Willow).
2. Other species of *Salix* (and *Populus*).
The bark is employed to make Salicin.

Santalaceæ

- Santalum Album* (Sandal Wood).
The oil distilled from the wood.

Sapotaceæ

1. *Dichopsis Gutta* or *Isonandra Gutta* (Gutta Percha).
2. Several other trees of the same order.
The concrete juice—Solution of Gutta Percha 1 in 8.
Enters into Mustard Paper.

Scrophulariaceæ

Digitalis purpurea (Foxglove).

The dried leaves of wild British plants of the second year's growth, collected when two-thirds of the flowers are expanded.

Infusion 3 grs. to 1 oz.; Tincture 1 in 8.

Simarubaceæ

Picræna excelsa, or *Quassia excelsa* (Quassia).

The chips, shavings, or raspings of the wood.

Extract, Tincture $\frac{3}{4}$ oz. to 1 pint, and Infusion 110 grains to 1 pint.

Smilacæ

Smilax officinalis (Jamaica Sarsaparilla).

The dried root.

Decoction 1 in 8; Compound Decoction 1 in 8; Liquid Extract 1 in 1.

Solanaceæ

1. *Capsicum fastigiatum* (Capsicum).

The dried ripe fruit—Tincture $\frac{3}{4}$ oz. to 1 pint.

2. *Atropa Belladonna* (Belladonna).

(a) The *fresh* leaves and branches, gathered when the fruit has begun to form, from wild or cultivated British plants. Extract (*green*).

(b) The *juice* from the above.

(c) The *dried* leaves separated from the branches, gathered, as in (a). Tincture 1 in 20.

(d) The dried root from cultivated or wild plants in Britain, or imported in the dry state from Germany—Alcoholic Extract; Plaster 1 in 5; Liniment 1 in 12; Ointment 1 in 10; and Atropine and Atropine Sulphate; Liquor 1 per cent.; Ointment 8 grs. to 1 oz.; and Discs $\frac{1}{5000}$ gr.

3. *Datura Stramonium* (Stramonium).

The dried ripe seeds—Extract; and Tincture 1 in 8.

The dried leaves.

4. *Hyoscyamus niger* (Henbane).

(a) The *fresh* leaves and flowers and branches collected from biennial wild or cultivated British plants when two-thirds of the flowers are expanded—Extract, which enters into 1 Pill.

(b) The *juice* extracted from the above.

(c) The *dried* leaves separated from flowers and branches, and collected as in (a)—Tincture 1 in 8.

5. *Nicotiana Tabacum* (Tobacco).

The dried leaves.

~~100~~ The last four plants are often classed under *Atropaceæ*.

Sterculiaceæ

Theobroma Cacao (Chocolate Tree).

The concrete oil, expressed from the seeds. Enters into 5 Suppositories.

Styracacæ or Styraceæ

1. *Styrax Benzoin* (Benzoin).

2. Probably one or more other species of *Styrax*.

The balsamic resin obtained from deep incisions in the bark.

Compound Tincture 1 in 10; Benzoic Acid and its preparations; Benzoated Lard 1 in 50. Enters into *Spermaceti* and various other Ointments.

Ternstroemiaceæ. (See *Camelliaceæ*.)

Belladonna leaf and fruit (see also) Solanaceæ

Thymelaceæ

1. *Daphne Mezereum* (Mezereon).
2. *Daphne Laureola* (Spurge Laurel).

The dried bark of both plants. Enters into Compound Decoction of Sarsaparilla.

Ethereal Extract. Enters into Compound Mustard Liniment.

Umbelliferæ

1. *Carum Ajowan* or *Ptychotis Ajowan*.

The volatile oil is used as a source of Thymol.

2. *Carum Carui* (Caraway).

The dried fruit—Water 1 lb. to 1 gallon, and Oil. Enters into 3 Confections, 2 Tinctures, 1 Powder, and 1 Pill.

3. *Conium maculatum* (Hemlock).

(a) The fresh leaves and young branches of wild British plants, collected when the fruit begins to form—Extract, Compound Pill $2\frac{1}{2}$ in 3.

(b) The juice—Cataplasm 1 in 15; Inhalation; and Ointment 2 in 1.

(c) The dried fully developed fruit, gathered when green—Tincture 1 in 8.

4. *Coriandrum sativum* (Coriander).

The dried ripe fruit—Oil. Enters into the Syrup, Confection, and Tincture of Senna, and into the Syrup and Tincture of Rhubarb.

5. *Dorema Ammoniacum* (Ammoniacum).

The gum-resin exuding from beetle punctures in the stem.

Mixture $\frac{1}{4}$ oz. to 8 ozs.; Plaster of A. and Mercury 12 in 15.

Enters into 1 Plaster and 2 Pills.

6. *Ferula Narthex* or *Narthex Asafoetida* (Asafoetida).

7. *Ferula Scorodosma* and probably other species.

A gum-resin from incisions in the living root.

Enema 30 grains to 4 ozs. Tincture 1 in 8; Compound Pill 1 in $3\frac{1}{2}$; Pill of Aloes and A. 1 in 4; Fetid Spirit 33 grs. to 1 oz.

8. *Ferula Sumbul* or *Euryangium Sumbul* (Sumbul).

The dried transverse sections of the root—Tincture 1 in 8.

9. *Ferula galbaniflua* (Galbanum).

10. *Ferula rubricaulis* and probably other species

Gum-resin—Plaster 1 in 11. Enters into Compound Asafoetida Pill.

11. *Fœniculum capillaceum* or *F. vulgare* (Fennel).

The dried fruit of cultivated plants.

Water 1 lb. to 1 gallon. Enters into Compound Liquorice Powder.


12. *Peucedanum graveolens* or *Anethum graveolens* (Dill).

The dried fruit—Water 1 lb. to 1 gallon, and Oil.

13. *Pimpinella Anisum* (Anise).

The dried fruit.

Oil; Water 1 lb. to 1 gallon; Essence 1 in 5. Enters into 2 Tinctures.

 Star-Anise (*Illicium anisatum*) belongs to the Magnoliaceæ.

Valerianaceæ

Valeriana officinalis (Valerian).

The dried rhizome and rootlets, collected in autumn from wild or cultivated plants in Britain.

Infusion 1 in 40; Tincture 1 in 8; Ammoniated Tincture 1 in 8.

Vitaceæ

Vitis vinifera (Grape Vine).

The dried ripe fruit from Spain. Enters into 2 Tinctures.

Zingiberaceæ or Scitamineæ1. *Curcuma longa* (Turmeric).

The dried rhizome—The Paper and Tincture 1 to 6 are contained in the B.P. Appendix, and are used for Testing.

2. *Elettaria Cardamomum* (Malabar Cardamom).

The dried ripe seeds—Compound Tincture 1 in 80.

Enters into 1 Compound Extract and 2 Powders, 2 Tinctures, and 1 Wine.

The Tincture enters into 1 Decoction, 2 Mixtures, and 1 Tincture.

3. *Zingiber officinale* (Ginger).

The seraped and dried rhizome.

Syrup 1 in 26; Tincture 1 in 8; Strong Tincture 1 in 2. Ginger or its Compounds also enters into 16 official preparations.

Zygophyllaceæ

- | | |
|------------------------------------|------------------------|
| 1. <i>Guaiacum officinale</i> , or | } <i>Lignum Vitæ</i> . |
| 2. <i>Guaiacum sanctum</i> , | |

The heart-wood in chips, raspings, or shavings.

Enters into Compound Decoction of Sarsaparilla.

The resin obtained from either 1 or 2. Mixture 11 grs. to 1 oz.; Ammoniated Tincture 1 in 5. Enters into Compound Calomel Pill.

Percentages of real acid in:

	<i>strong</i>	<i>del</i>
<i>acetic</i>	33%	1 in 8
<i>HCl</i>	32%	1 in 3.3
<i>HCN</i>	—	1 in 50
<i>Lactic</i>	75%	1 - 6 ² / ₃
<i>HNO₃</i>	70%	1 - 5 ¹ / ₆
<i>H₂PO₄</i>	66%	1 - 6 ² / ₃
<i>H₂SO₄</i>	98%	1 - 14.

OFFICIAL REMEDIES.

ACACIÆ GUMMI (Gum Acacia)—Leguminosæ.

Gum Arabic; an exudation from the stem of *Acacia Senegal*, and other species of acacia, in spheroidal, colourless tears, or in angular, glistening, colourless or yellowish fragments.

Demulcent. Used to suspend insoluble powders in mixtures.

Gum Acacia enters into chalk and guaiacum mixtures, compound almond, and tragacanth powders, all the lozenges, and the following:—

Mucilago Acaciæ 4 and 6.

An almost colourless, translucent, viscid liquid; prepared by dissolving 4 oz. gum acacia in 6 oz. cold distilled water.

Enters into all the lozenges except opium.

Dose—I to 4 drs.

ACETANILIDUM (Acetanilide) C_8H_9NO

Synonym—Phenyl-Acetamide $C_6H_5NHC_2H_3O$

Commonly known as Antifebrin. Colourless, glistening, scaly crystals, obtainable by acting on aniline by glacial acetic acid.

Antipyretic and Analgesic. Dose—3 to 10 grs.

ACETUM (Vinegar). *Onion*

A brownish, acid liquid, prepared from malt and unmalted grain by the acetous fermentation. Contains 5·4 per cent. of real acetic acid.

Refrigerant and Diuretic. Dose—I dr. to 1 oz.

It is used in making brown soap plaster.

Acetum Cantharidis, Acetum Ipecac., and Acetum Scillæ—(See under "*Cantharis, Ipecac. Scilla.*")**ACIDUM ACETICUM** (Acetic Acid) $HC_2H_3O_2$

A colourless acid liquid, with a pungent odour, prepared from wood by destructive distillation, and subsequently purified, and containing 33 per cent. of real acetic acid.

Counter-irritant, Vesicant, and Caustic.

The following preparations contain free acetic acid:—

Acetum; Acetum Cantharidis; Acetum Scillæ; Acid. Aceticum; Acid. Aceticum Dilutum; Acid. Aceticum Glaciale; Extract. Colchici Aceticum; Liniment. Terebinth. Acet.; Mistura Creasoti; Oxymel; Oxymel Scillæ; Syrupus Scillæ; Tinct. Ferri Acetatis; Liquor Morphinæ Acetatis; Acetum Ipecac.

MB

Acidum Aceticum Dilutum 1 in 8.

A colourless liquid, prepared by mixing acetic acid 1 pint. and distilled water 7 pints. Contains 4.27 per cent. of real acetic acid.

Dose and action same as "Acetum."

IN—Acetum Scillæ., Acetum Ipecac., and Liquor Morphinæ Acetatis.

Acidum Aceticum Glaciale (Glacial Acetic Acid)

Concentrated acetic acid—a colourless fluid, crystallising when cooled, and containing nearly 99 per cent of real acid.

Powerfully Caustic.

IN—Acetum Cantharidis, Mistura Creasoti, Lin. Tereb. Acet., and Liq. Ferri Acet. Fort.

The following are the percentages of real acetic acid found in Vinegar, 5.41; Acetic Acid, 33.0; Dilute Acetic Acid, 4.27; Glacial Acetic Acid, 98.8.

ACIDUM ARSENIOSUM (Arsenious Acid) As_2O_3

(Synonyms—Arsenic; Arsenicum Album; White Arsenic Anhydrous Arsenious Acid; Arsenious Anhydride).

An anhydride (not a true acid), occurring as a heavy white powder or in sublimed vitreous masses, obtained by roasting arsenical ores.

Alterative, Tonic, and Caustic. Dose— $\frac{1}{60}$ to $\frac{1}{12}$ gr.

Liquor Arsenicalis 1 in 100. (Synonyms—Liquor Potassæ Arsenitis; Fowler's Solution).

A pinkish liquid, composed of arsenious acid in powder, and carbonate of potassium, of each 87 grains; compound tincture of lavender 5 drs., distilled water to 1 pint.

This is the most frequently used preparation of arsenic; and, like all the preparations of the drug, should be commenced in small doses and gradually increased. A good rule is to begin in adults with 2 minims and gradually increase to 8 or more—always after meals, and freely diluted. Children bear as large doses as adults.

Liquor Arsenici Hydrochloricus 1 in 100.

A colourless liquid, prepared by dissolving arsenious acid 87 grains in hydrochloric acid 2 drs., and distilled water to 1 pint (This is three times the strength of De Valangin's Solvent.)

Dose—2 to 8 minims, freely diluted.

Arsenii Iodidum (Iodide of Arsenium) AsI_3

(Synonyms—Arsenious Iodide; Iodide of Arsenic).

Small orange crystals obtained by direct combination of iodine and arsenium, or by evaporating a solution of arsenious and hydriodic acids.

Alterative and Tonic. Dose— $\frac{1}{30}$ grain.

As acid, 3 salts require to

be prepared from arsenium

Liquor Arsenii et Hydrargyri Iodidi (Synonym—Donovan's solution) 1 in 100.

A clear, pale yellow liquid, prepared by dissolving 45 grs. of iodide of arsenium and 45 grs. of red iodide of mercury in 10 oz. distilled water.

Alterative and Antisymphilitic. Dose—10 to 30 minims.

Ferri Arsenias (Arsenates of iron with some oxide)

A tasteless, amorphous, greenish powder, insoluble in water, but readily soluble in hydrochloric acid. Prepared by mixing solutions of arseniate and bicarbonate of sodium with one of sulphate of iron, filtering and drying at a low temperature.

Alterative like Arsenic. Dose— $\frac{1}{16}$ to $\frac{1}{2}$ grain, in pill.

Sodii Arsenias $\text{Na}_2\text{H AsO}_4, 7\text{H}_2\text{O}$ and $\text{Na}_2\text{HAsO}_4, 12\text{H}_2\text{O}$

Colourless, transparent prisms, soluble in water; prepared by fusing a mixture of arsenious acid, nitrate of sodium, and dried carbonate of sodium, dissolving the fused product in boiling water, and setting the solution aside to crystallise.

Dose— $\frac{1}{16}$ to $\frac{1}{8}$ grain, in pill or in mixture.

Liquor Sodii Arseniatis 1 in 100.

A colourless solution of *anhydrous* arseniate of sodium, 4.5 grs. in distilled water 1 oz. (Pearson's solution is 1 in 600.)

Dose—5 to 10 minims, diluted, after food.

ACIDUM BENZOICUM (Benzoic Acid) $\text{HC}_7\text{H}_5\text{O}_2$

A crystalline acid, obtained from benzoin by sublimation. In light feathery plates and needles, nearly colourless, and smelling like benzoin. It is not chemically pure.

Antiseptic, Expectorant and Diuretic. Dose—10 to 15 grs.

Is—Benzoates of Soda, and Ammonium, Tr. Camp. Co. and Tr. Opii Ammon., and

Trochisci Acidi Benzoici $\frac{1}{2}$ gr. in each.

Composed of benzoic acid, sugar, gum acacia, mucilage of gum acacia, and distilled water.

Dose 1 to 5 lozenges.

ACIDUM BORICUM (Boric Acid) H_3BO_3

(Synonym—Boracic Acid). Colourless, pearly, lamellar crystals, obtained by the action of sulphuric acid on borax, or from native boric acid. Dose—5 to 30 grs.

Antiseptic and Diuretic. Enters into Unguentum Conii.

Unguentum Acidi Borici 1 in 7.

A white or faintly yellow ointment, prepared by adding sifted boric acid 1 part to a melted mixture of 2 parts of hard and 4 parts of soft paraffin.

Antiseptic.

100-113 15 grs. or 15 minims for 100 parts:
 100-113 15 grs. or 15 minims for 100 parts:
 100-113 15 grs. or 15 minims for 100 parts:
 100-113 15 grs. or 15 minims for 100 parts:

ACIDUM CARBOLICUM (Carbolic Acid) $\text{HC}_6\text{H}_5\text{O}$

(Synonyms—Phenic Acid ; Phenol ; Phenic Alcohol).

slwg
An acid obtained by the fractional distillation of coal-tar. colourless acicular crystals, or in faintly reddish crystalline masses, which become an oily liquid like creasote, at 91.5° .

Antiseptic and Escharotic. Dose—1 to 3 grs., in pill.**Acidum Carbolicum Liquefactum** 90 per cent.

A colourless or slightly reddish liquid, prepared by the addition of 10 per cent. of water to carbolic acid.

Dose—1 to 4 minims, largely diluted.

Glycerinum Acidi Carbolici 1 to 4 (1 in 6 by weight).

A thick, colourless liquid, prepared by dissolving carbolic acid 1 oz. in glycerine 4 oz. One fluid drachm contains 12 grs.

Dose—5 to 15 minims, freely diluted.

Suppositoria Acidi Carbolici Cum Sapone 1 gr. in each

Carbolic acid 12 grs., curd soap 180 grs., glycerine of starch 12 grs. Divided into 12 small conical masses.

Antiseptic and Local Anæsthetic.

Unguentum Acidi Carbolici 1 in 19.

Carbolic acid 1, soft paraffin 12, and hard paraffin 6 parts.

Antiseptic and Deodorant.

ACIDUM CHROMICUM (Chromic Acid) CrO_3

(Synonyms—Anhydrous Chromic Acid ; Chromic Anhydride)

An anhydride in crimson acicular crystals, prepared by mixing a solution of bichromate of potassium with sulphuric acid, rejecting the crystals of acid sulphate of potassium which crystallise out, heating the liquor and adding more sulphuric acid when the anhydrous acid crystallises out.

Caustic.

Liquor Acidi Chromici 1 in 4, or $29\frac{1}{2}$ per cent. real acid.

An orange-red, inodorous, acid liquid, prepared by dissolving 1 oz. chromic acid in 3 oz. distilled water.

Caustic.

ACIDUM CITRICUM (Citric Acid) $\text{H}_3\text{C}_6\text{H}_5\text{O}_7, \text{H}_2\text{O}$

An acid, in colourless rhombic crystals, obtained from the juice of the lemon, or Citrus limetta (The Lime) by boiling, adding chalk, and decomposing the resulting citrate of calcium with sulphuric acid.

Refrigerant—Dose—10 to 30 grs., in water.

20 grs. dissolved in half an oz. of water, are equivalent to one tablespoonful of fresh lemon juice, and will saturate in an effervescing mixture.

30 grs. bicarbonate of potassium in 1 oz. water.

24 grs. carbonate of potassium in 1 oz. water.

41 grs. carbonate of sodium in 1 oz. water.

24 grs. bicarbonate of sodium in 1 oz. water.

17 grs. carbonate of ammonium in 1 oz. water.

Succus Limonis, Syr. Limonis, Syr. Ferri Subchlor., Vin. Quininae, Sodii Phosp. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves. contain free citric acid.

ACIDUM GALLICUM (Gallic Acid) $\text{H}_3\text{C}_7\text{H}_3\text{O}_5, \text{H}_2\text{O}$

Q

An acid in yellowish-white, satiny needles, prepared by boiling 1 part of galls with 4 of dilute H_2SO_4 , straining whilst hot and purifying, with animal charcoal, the acid which crystallises out. Soluble in 100 parts of cold water.

Astringent. Useful in internal hæmorrhages.

Dose—2 to 10 grs. in solution, in pill or in powder.

MS,

Glycerinum Acidi Gallici 1 to 4 (1 in 6 by weight).

A brownish, thick liquid, prepared by dissolving on a water-bath 1 oz. of gallic acid in 4 fluid oz. of glycerine.

Astringent and Styptic. Dose—20 to 60 minims.

Preparations containing gallic or tannic acids should not be combined with any preparation containing iron.

ACIDUM HYDROBROMICUM DILUTUM 1 in 10.

A colourless aqueous solution, containing 10 per cent of real hydrobromic acid, HBr ., prepared by distilling a mixture of bromine and water, through which H_2S has been passed till the red colour is discharged. The distillate is diluted with water till the S.G. reaches 1.077.

Hypnotic and Sedative, like KBr . Dose—15 to 50 minims.

ACIDUM HYDROCHLORICUM (Hydrochloric Acid)

(Synonym—Muriatic Acid). Hydrochloric acid gas (HCl) dissolved in water, and forming 32 per cent. of the solution, which is nearly colourless and strongly acid, emitting white vapours, with a pungent odour. It is obtained by distilling a mixture of common salt, sulphuric acid, and water.

Caustic—not used internally in this form.

IN—Acid. Nitro-Hydrochlor. Dil.; Liq. Antim. Chloridi; Liq. Arsenici Hydrochlor., and the following:—

Acidum Hydrochloricum Dilutum 1 in 3.3. (10.5 per cent. real acid.)

A colourless mixture of hydrochloric acid and distilled water.

Dose—10 to 30 minims, in water.

IN—Liq. Morph. Hydrochlor. and Liq. Strychninae Hydrochlor.

ACIDUM HYDROCYANICUM DILUTUM 1 in 50.(Diluted Hydrocyanic Acid) **HCN**

Prussic Acid, dissolved in water, and forming 2 per cent. of the solution; prepared by acting on ferrocyanide of potassium with sulphuric acid, and distilling the mixture. It is a colourless liquid, with a strong odour of peach blossoms.


Sedative—a deadly poison. Dose—2 to 8 minims, in water.

Scheele's Prussic Acid is $2\frac{1}{2}$ times stronger than the above.

IN—Tinctura Chloroformi et Morphinæ 1 in 16, and

Vapor Acidi Hydrocyanici

Diluted hydrocyanic acid, 10 to 15 minims; cold water 1 dr.—mixed in a suitable apparatus, and the vapour inhaled.

 Hydrocyanic acid exists in Aqua Laurocerasi ('1 per cent.).

ACIDUM LACTICUM (Lactic Acid) **HC₃H₅O₃**

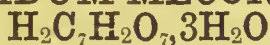
A colourless syrupy liquid, consisting of lactic acid and 25 per cent. of water, prepared by the action of a peculiar ferment on solution of sugar, and subsequently purified.

A solvent of false membranes.

Acidum Lacticum Dilutum 3 in 20.

A colourless liquid, consisting of lactic acid, 3 oz., and distilled water q.s. to 1 pint.

Tonic and Refrigerant. Dose— $\frac{1}{2}$ to 2 drs., freely diluted.

ACIDUM MECONICUM (Meconic Acid)

An acid in micaceous crystals, obtained from opium, and possessing feeble physiological action. It is only used in making Liquor Morphinæ Bimeconatis.

ACIDUM NITRICUM (Nitric Acid) **HNO₃**

An acid prepared from nitrate of potassium, or nitrate of sodium, by distillation with sulphuric acid and water, and containing 70 per cent. by weight of real HNO₃. A colourless heavy liquid, emitting an acrid, corrosive vapour.

Corrosive—Not used internally in this form.

IN—Liq. Ferri Pernit., Liq. Hydrarg. Nit. Acidus, Ungt. Hyd. Nit., and

Acidum Nitricum Dilutum 1 in $5\frac{1}{6}$.

A colourless mixture of nitric acid 6 oz. and distilled water 25 oz.—corresponding to 17.44 per cent. real acid.

Tonic and Astringent. Dose—10 to 30 minims.

Acidum Nitro-Hydrochloricum Dilutum $\frac{3}{4}$ and 1 in 8.

Nitric Acid, 3 oz.; hydrochloric acid, 4 oz.; distilled water 25 oz., making a colourless liquid, which should be kept in a stoppered bottle 14 days before being used. It contains free

chlorine, hydrochloric, nitric and nitrous acids, and other compounds dissolved in water.

Dose—5 to 20 minims, freely diluted.

ACIDUM OLEICUM (Oleic Acid) $\text{HC}_{18}\text{H}_{33}\text{O}_2$

A straw-coloured liquid, nearly odourless and tasteless, obtained by the saponification of olein, or by the action of superheated steam on fats, with subsequent separation from solid fats, by pressure.

Only used in making Oleatum Hydrarg., Oleatum Zinci, and Ungt. Zinci oleati.

ACIDUM PHOSPHORICUM CONCENTRATUM

(Concentrated Phosphoric Acid) H_3PO_4

A colourless syrupy liquid, consisting of phosphoric acid with 37 per cent. of water, obtained by distilling a mixture of 413 lbs. phosphorus, 6 fl. oz. of nitric acid, and q.s. distilled water, and afterwards evaporating the distillate to 3 fl. oz.

Externally Caustic. Internally Tonic. Dose—2 to 5 minims.

IN—Syrupus Ferri Phosphatis and

Acidum Phosphoricum Dilutum 3 in 20. (10 per cent. P_2O_5)

A colourless liquid, prepared by mixing 3 oz. concentrated phosphoric acid with q.s. distilled water to measure 1 pint.

Tonic and Refrigerant. Dose—10 to 30 minims.

ACIDUM SALICYLICUM (Salicylic Acid) $\text{HC}_7\text{H}_5\text{O}_3$

An acid in white acicular crystals, obtained by the combination of the elements of carbolic acid with those of carbonic acid gas, and subsequent purification; or from natural salicylates, as oils of wintergreen (*Gaultheria procumbens*) and sweet birch (*Betula nigrata*).

Antipyretic and Antirheumatic. Dose—5 to 30 grs.

Enters into Liq. Cocainæ Hydrochlor.

unguentum Acidi Salicylici 1 in 28.

A yellowish or white ointment, prepared by melting together 1 part of salicylic acid, 9 parts of hard and 18 parts of soft raffin.

Sodii Salicylas $(\text{NaC}_7\text{H}_5\text{O}_3)_2, \text{H}_2\text{O}$

Small colourless crystalline scales, obtained by the action of salicylic acid on carbonate of sodium or on caustic soda.

Antipyretic and Antirheumatic. Dose 10 to 30 grs. in water.

Salicylic Acid or its Sodium Salt should not be prescribed with Quinine mixture.

may, double amount of soft paraffin.

Aconitina (Aconitine) (Synonym—Aconitia).

A white amorphous alkaloid, obtained from aconite root. Aconite root is boiled and percolated with spirit, the spirit is evaporated, a watery solution of the residue, treated with ammonia, gives the alkaloid, which is afterwards purified by ether and water acidulated with sulphuric acid.

A powerful Poison. Should not be given internally.

Unguentum Aconitinæ 8 grs. to 1 oz.

A white ointment, composed of aconitine 8 grs. ; rectified spirit, $\frac{1}{2}$ dr. ; benzoated lard, 1 oz.

Similar in action to the liniment.

ADEPS BENZOATUS (Benzoated Lard) 1 to 50.

Made by heating 1 lb. of prepared lard and 140 grs. of benzoin for two hours on a water-bath, and straining.

Emollient. Less liable to decompose than *Adeps Præparatus*.

Enters into the composition of about $\frac{1}{3}$ of the ointments.

Unguentum Simplex (Simple Ointment).

An emollient white ointment composed of white wax 2 oz. benzoated lard 3 oz., and almond oil 3 oz., melted and stirred till cold.

It enters into eight ointments.

ADEPS LANÆ (Wool Fat).

A yellowish, sticky unctuous, almost odourless, substance being the purified cholesterin-fat of sheep's wool. Used for the preparation of

Adeps Lanæ Hydrosus (Hydrous Wool Fat).

Commonly known as Lanoline, and prepared by adding 3 oz. distilled water to 7 oz. melted wool fat, and stirring till thoroughly mixed.

Emollient—Used as a basis for ointments.

IN—Unguentum Conii.

ADEPS PRÆPARATUS (Prepared Lard).

The internal soft white fat from the abdomen of the hog (*Scrofa*), purified by melting and straining.

It enters into the preparation of 31 ointments (either as lard, benzoated lard, or simple ointment), and into *Emplastrum Cantharidis*.

ÆTHER (Ether) (Synonym—Sulphuric Ether). (C_2H_5)

A colourless, volatile, inflammable liquid, with a strong odour, containing not less than 92 per cent. by vol. of pure ether, 1

Used in the preparation of ether

and then 3 Ss. of ether

The dose of each about 3i

If you mean then you should be, same.

pared from alcohol by the action of sulphuric acid ; subsequently purified by slaked lime and chloride of calcium.

A general diffusible Stimulant and Narcotic.

Dose—20 to 60 minims, in syrup or water.

IN—Collodium, Collodium Flexile, Tinct. Lobeliæ Ætherea, and Tinct. Chloroformi et Morphinæ and the following:—

Ether Purus (Pure Ether) (Synonym—Oxide of Ethyl).

Ether freed from alcohol and water by the action of chloride of calcium, lime, and redistillation.

Used externally as a local Anæsthetic.

Spiritus Ætheris 1 in 3.

Ether 10 oz., rectified spirit 20 oz. (mixed)—making a colourless liquid.

Dose—30 to 90 minims.

IN—Tinctura Lobeliæ Ætherea.

Spiritus Ætheris Compositus 1 in 3 nearly.

(Synonym—Hoffmann's Anodyne). A colourless liquid, consisting of 3 drs. of heavy oil of wine (prepared by the action of sulphuric acid on rectified spirit), 8 oz. of ether, and 16 oz. rectified spirit.

Stimulant and Anodyne. Dose— $\frac{1}{2}$ to 2 drachms, diluted.

Spiritus Ætheris Nitrosi (Spirit of Nitrous Ether)

(Synonym—Spiritus Ætheris Nitrici). A transparent and almost colourless "spirituous solution containing nitrous compounds, aldehyd, and other substances," obtained by cautiously heating together 3 oz. nitric acid, 2 oz. Sulphuric acid, 2 oz. copper wire, and 1 pint rectified spirit in a retort, and afterwards adding 2 pints rectified spirit to the 14 oz. of distillate.

Diaphoretic, Diuretic, and Antispasmodic.

Dose— $\frac{1}{2}$ to 2 drs. ; 8 minims for a child 1 year old.

ÆTHER ACETICUS (Acetic Ether) $C_2H_5C_2H_3O_2$

(Synonym—Acetate of Ethyl). A colourless liquid, with an agreeable odour, prepared by distilling acetate of sodium, rectified spirit, and sulphuric acid, and purifying by the action of carbonate of potassium.

Stimulant. Dose—20 to 60 minims.

IN—Liquor Epispasticus.

ALCOHOL AMYLICUM (Amylic Alcohol) $C_5H_{11}HO$ *on it*

(Synonyms—Fousel Oil ; Hydrate of Amyl). A colourless, oily liquid, with an offensive odour, obtained in the distillation of the crude spirit produced by the action of yeast on saccharine solutions, purified by redistillation ; only the product passing over at 262° to 270° should be collected.

Only used in the preparation of Amyl Nitris and Sodii Vateriaanas.

ALCOHOL ETHYLICUM (Ethylic Alcohol) C_2H_5HO

(Synonym—Absolute Alcohol). A colourless liquid, containing not more than 1 or at most 2 per cent. of water, prepared by extracting the water from rectified spirit, by macerating it with anhydrous carbonate of potassium and recently dried chloride of calcium, and distilling. S.G. from .797 to .800.

Used in the preparation of Chloroform and Liq. Sodii Ethylatis.

ALOE BARBADENSIS (Barbadoes Aloes)—Liliaceæ.

The juice, when inspissated, which flows from the transversely cut base of the leaf of *Aloe vulgaris*, from Barbadoes and Curaçoa, in dark brown masses, the smallest films of which are translucent and orange-brown in tint, with a disagreeable odour like the axilla. The powder is a dull greenish yellow.

ALOE SOCOTRINA (Socotrine Aloes)—Liliaceæ.

The juice, when inspissated, which flows from the transversely cut base of the leaf of *Aloe Perryi*, and probably other species from Socotra and Zanzibar, in golden or reddish brown masses, the small fragments of which are translucent at the edges, with an agreeable aromatic odour. The powder is a bright yellow or orange-brown colour.

Cathartic—Both varieties are similar in action.

Dose 2 to 6 grs. in pill.

ALOIN (Alain) $C_{16}H_{18}O_7$

Yellow inodorous tufts of acicular crystals, extracted from different varieties of aloes by solvents, and purified by recrystallisation.

Cathartic. Dose $\frac{1}{2}$ to 2 grs. in pill.

In addition to the preparations bearing the name Aloes, all of which are given in the following pages, the drug enters into

Pil. Cambogiæ Co., 1 in 6.

Pil. Rhei. Co., 1 in 6.

Pil. Colocynth. Co., 1 in 3.

Extract. Colocynth. Co., 1 in 24.

Pil. Colocy. et Hyoscy., 1 in 4½.

Tinct. Benzoini Co., 1 in 60.

Decoctum Aloes Compositum 4 grs. (Ext.) in 1 oz.

A rich, dark-brown liquid, prepared by boiling together for five minutes extract of Socotrine aloes, $\frac{1}{2}$ oz.; myrrh, saffron, and carbonate of potassium, of each $\frac{1}{4}$ oz.; extract of liquorice 2 oz.; compound tincture of cardamoms, 15 oz.; distilled water to 50 oz. The tincture should be added after cooling.

Dose— $\frac{1}{2}$ to 2 oz.

Enema Aloes 4 grs. in 1 oz.

Aloes, 40 grs.; carbonate of potassium, 15 grs.; mucilage of starch, 10 oz.—mixed and rubbed together.

5 pills + 2 extracts

The juice of the Socotrine Aloes is much more agreeable than that of the Barbadoes Aloes. The powder of the Socotrine Aloes is much more agreeable than that of the Barbadoes Aloes.

Extractum Aloes Barbadosis 4 parts from 5.

A *solid* extract, obtained by dissolving Barbadoes aloes in boiling water, and evaporating the solution.

Dose—2 to 6 grs. in pill. It is less liable to gripe than the powdered aloes.

Extractum Aloes Socotrinæ 1 part from 2.

Preparation and dose same as the preceding.

Enters into Dec. Aloes Co. and Extract. Colocynth. Co.

Pilula Aloes Barbadosis 1 in 2.

Barbadoes aloes (in powder), 2 oz.; hard soap (in powder), 1 oz.; oil of caraway, 1 dr.; confection of roses, 1 oz.

Dose—5 to 10 grs.

Pilula Aloes Socotrinæ 1 in 2.

Socotrine Aloes (in powder), 2 oz.; hard soap (in powder), 1 oz.; volatile oil of nutmeg, 1 dr.; confection of roses, 1 oz.

Dose—5 to 10 grs.

Pilula Aloes et Asafœtidæ 1 in 4.

Socotrine aloes, asafœtida, hard soap, and confection of roses, of each 1 oz.

Cathartic and Antispasmodic. Dose—5 to 10 grs.

Pilula Aloes et Ferri 1 in $5\frac{1}{4}$.

Sulphate of iron, $1\frac{1}{2}$ oz.; Barbadoes aloes, 2 oz.; compound powder of cinnamon, 3 oz.; confection of roses, 4 oz.

Cathartic and Emmenagogue. Dose—5 to 10 grs.

Pilula Aloes et Myrrhæ 1 in $2\frac{1}{2}$ nearly.

Socotrine aloes, 2 oz.; myrrh, 1 oz.; saffron (dried), $\frac{1}{2}$ oz.; treacle, 1 oz.; glycerine, q.s. Known as Rufus' Pill.

Cathartic and Emmenagogue. Dose—5 to 10 grs.

Tinctura Aloes 11 grs. in 1 oz.

A dark brown liquid, prepared by macerating Socotrine aloes $\frac{1}{2}$ oz., extract of liquorice $1\frac{1}{2}$ oz., in proof spirit 1 pint.

Dose—I to 2 drachms.

Vinum Aloes $16\frac{1}{2}$ grs. in 1 oz.

A dark brown liquid, prepared by macerating Socotrine aloes $1\frac{1}{2}$ oz., cardamoms and ginger, of each 80 grs., in sherry 2 pints.

Dose—I to 2 drachms.

ALUMEN (Alum) $\text{Al}_2\text{SO}_4\text{K}_2\text{SO}_4, 24\text{H}_2\text{O}$

Or $\text{Al}_2\text{SO}_4(\text{NH}_4)_2\text{SO}_4, 24\text{H}_2\text{O}$

A sulphate of aluminium and potassium (potash alum), of aluminium and ammonium (ammonia alum), crystallised

from aqueous solution, in colourless transparent crystalline masses. Crystals soluble in 10 or 11 parts of water.

Astringent. In large doses Emetic. Dose—10 to 20 grs.

Alumen Exsiccatum (Dried Alum) $\text{Al}_2\text{SO}_4\text{K}_2\text{SO}_4$

Prepared by heating potassium alum until it loses $45\frac{1}{2}$ per cent. of its weight, and reducing the residue to powder.

Externally—Styptic.

Glycerinum Aluminis 1 to 5 (1 in $7\frac{1}{4}$ by weight).

A thick syrupy liquid, prepared by heating 1 oz. alum with 5 oz. glycerine, and pouring off the clear liquid from any deposit after settling.

Local Astringent.

AMMONIACUM (Ammoniacum)—Umbelliferæ.

A gum-resinous exudation, from the stem (after being punctured by beetles) of *Dorema Ammoniacum*, in pale brown tears or masses, breaking with a smooth *white* fracture.

A Stimulating Expectorant. Dose—10 to 20 grs.

Emplastrum Ammoniaci Cum Hydrargyro 12 in 15.

Ammoniacum, 12 oz.; mercury, 3 oz.; olive oil, 56 grs.; sulphur, 8 grs.; mixed with the aid of heat.

Resolvent to enlarged glands.

Mistura Ammoniaci $13\frac{1}{2}$ grs. in 1 oz.

Ammoniacum $\frac{1}{4}$ oz., rubbed with 8 oz. distilled water, and strained to form a whitish emulsion, like dirty milk.

Dose— $\frac{1}{2}$ to 1 oz.

Ammoniacum also enters into the composition of Empl. Galbani, Pil. Scillæ Co. and Pil. Ipecac. cum Scilla.

AMMONII BENZOAS (Benzoate of Ammonium)

$\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$ (Synonym—Benzoate of Ammonia).

Colourless laminar crystals, prepared by acting on solution of ammonia with benzoic acid, evaporating and crystallising.

Diuretic. Dose—10 to 20 grs. in water.

Ammonii Bromidum NH_4Br

In colourless crystals, which may become slightly yellow by exposure to the air, and which are very soluble in water; formed by neutralising hydrobromic acid with ammonia, evaporating and crystallising.

Laryngeal Sedative. Useful in Whooping Cough.

Dose—2 to 20 grains. For a child 1 year old, 2 grains.

Ammonii Carbonas $\text{N}_3\text{H}_{11}\text{C}_2\text{O}_5$ ($\text{NH}_4\text{HCO}_3 +$

$\text{NH}_4\text{NH}_2\text{CO}_2$) (Synonyms—Ammonia Carbonas; Ammonia Sesquicarbonas).

A volatile salt, in translucent crystalline masses, with strong



6 salt 1 lin
6 liquor 14 lin
2- cherils

Ammoniacal odour, prepared by subliming a mixture of sulphate and chloride of ammonium and carbonate of calcium.

A Diffusible Stimulant, Expectorant and Emetic.

Dose 3 to 10 grs. ; 17 grs. neutralise $\frac{1}{2}$ oz. lemon juice.

—Liq. Ammon. Acet. Fort., Spt. Ammon. Aromat. and Bismuth. Carb.

Ammonii Chloridum NH_4Cl (Synonym—Sal Ammoniac).

In colourless, inodorous, translucent, fibrous masses ; tough, and difficult to powder ; very soluble in water ; prepared by neutralising hydrochloric acid with ammonia and evaporating.

Expectorant and Ciliary Excitant.

Dose—5 to 20 grains. Pieces may be sucked like a lozenge.

—Liq. Hydrarg. Perchlor. and Liq. Ammoniae Fortior.

Ammonii Nitras NH_4NO_3

A white deliquescent salt, produced by neutralising dilute nitric acid with solution, or carbonate of ammonium, evaporating and fusing the crystals under a heat of 320° .

Only used for making nitrous oxide.

Ammonii Phosphas $(\text{NH}_4)_2\text{HPO}_4$

In transparent colourless prisms, which have crystallised out of concentrated solution of ammonia which has been neutralised with dilute phosphoric acid.

Diuretic. Dose—5 to 20 grs. in water.

Linimentum Ammoniae 1 in 4.

An emulsion known as "hartshorn and oil," composed of—Solution of ammonia, 1 oz. ; olive oil, 3 oz.

Rubefacient.

Liquor Ammoniae Fortior NH_3 15·8 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 32·5 per cent. of the solution, prepared by distilling a mixture of chloride of ammonium, slaked lime, and water.

Caustic. Should not be used internally.

—Liniment. Camph. Co., Liquor Ammoniae, Liquor Ammonii Citratis, Spiritus Ammoniae Aromaticus, Tinctura Opii Am., Ammonii Phosphas Spt. Am. Fœtid.

Liquor Ammoniae NH_3 1 in 3. 5·2 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 10 per cent. of the liquid, prepared by mixing one pint of strong solution of ammonia with two pints of distilled water.

Stimulant and Rubefacient. Dose—5 to 15 minims.

—Linim. Ammoniae, Linim. Hydrarg. and Tr. Quininæ Ammon.

Liquor Ammonii Acetatis Fortior $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$

A colourless liquid, prepared by neutralizing $15\frac{1}{2}$ oz. carbonate of ammonium with 50 oz. acetic acid, and adding water to 60 oz. Contains about 30 per cent. $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$

Diuretic and Diaphoretic. Dose—25 to 75 minims.

Liquor Ammonii Acetatis 1 in 5.

A colourless liquid, prepared by mixing 1 oz. of the above strong solution of acetate of ammonium with 4 oz. distilled water. Known as *Mindererus Spirit*.

Diaphoretic. Dose—2 to 6 drs; in acute alcoholism 2 oz.

Liquor Ammonii Citratis Fortior $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$

A colourless liquid, prepared by neutralizing 12 oz. citric acid with 11 oz. strong solution of ammonia, and adding distilled water to 1 pint. Contains 68 per cent. of $(\text{NH}_4)_3\text{C}_6\text{H}_5\text{O}_7$.

Diuretic. Dose— $\frac{1}{2}$ to $1\frac{1}{2}$ drs.

Liquor Ammonii Citratis 1 in 4.

A colourless liquid, prepared by mixing 1 oz. of strong solution of citrate of ammonium with 3 oz. distilled water.

Diuretic. Dose—2 to 6 drs.

Spiritus Ammoniae Aromaticus 1 of Carbonate and 2 of Liq. Ammon. Fort. in 40. (Synonyms—*Spiritus Ammoniae Compositus*; *Sal Volatile*).

An almost colourless liquid, prepared by distilling $4\frac{1}{2}$ drs., volatile oil of nutmeg, $6\frac{1}{2}$ drs. oil of lemon, 6 pints spirit, and 3 of water. 7 pints are collected and set aside; 9 oz. are then collected, and in this quantity are dissolved with a gentle heat 4 oz. carbonate of ammonia, and 8 oz. strong solution of ammonia, the solution being then added to the 7 pints of distillate. The whole should measure 8 pints.

Cardiac Stimulant. Dose $\frac{1}{2}$ to 1 dr. diluted.

Often wrongly prescribed with Syrup of Squill.

IN—*Tinctura Guaiaci Ammon.* and *Tinct. Valerianae Ammon.*

Spiritus Ammoniae Foetidus 1 of Liq. Am. Fort. in 10.

Prepared by distilling $1\frac{1}{2}$ oz. asafœtida with *q.s.* rectified spirit, and adding to the distillate 2 oz. strong solution of ammonia and spirit to measure 20 oz.

Stimulant and Antispasmodic. Dose— $\frac{1}{2}$ to 1 dr., diluted.

AMYGDALA AMARA (Bitter Almond)—*Rosaceæ*.

The ripe seed of the bitter almond tree, *Prunus Amygdalus var. amara* (*Amygdalus communis var. amara*). Has a bitter taste, is broader and shorter than the sweet almond, and its aqueous emulsion has the odour of peach blossom.

Yields, when pressed, *Oleum Amygdalæ*.

Amygdala Dulcis (Sweet or Jordan Almond)—Rosaceæ.

The ripe seed of the sweet almond tree, *Prunus Amygdalus ar. dulcis* (*Amygdalus communis var. dulcis*), from Malaga; about one inch in length, narrow, and sharp pointed, with clear brown seed coat, and a sweet taste.

Nutrient and Demulcent.

Yields, when pressed, *Oleum Amygdalæ*, and enters into

Pulvis Amygdalæ Compositus 8 in 13.

A coarse, whitish powder, composed of 8 oz. of *sweet* almonds with their coats removed by steeping in hot water), 4 oz. sugar, and 1 oz. powdered gum acacia.

Mistura Amygdalæ 1 in 8.

A white emulsion, made by rubbing 2 oz. of compound powder of almonds with 16 oz. of distilled water, and straining.

Dose—I to 2 oz.

Chiefly used as a vehicle for other medicines, and as a basis for lotions.

Oleum Amygdalæ (Almond Oil).

The pale yellow; almost inodorous, expressed oil from *bitter* or *sweet* almonds.

Demulcent and Emollient. Dose—I to 4 drs.

Used in the preparation of simple, spermaceti, and resin ointments, and in phosphorated oil.

This harmless oil, which is commonly called almond oil, should not be confounded with the oil *distilled* from the bitter almond, which is known as the oil of bitter almonds, and which is a deadly poison, being four times the strength of Prussic acid. It is not, however, in the Pharmacopœia.

AMYL NITRIS (Nitrite of Amyl) $C_5H_{11}NO_2$

An ethereal, yellowish liquid, with a peculiar odour, prepared by the action of nitric or nitrous acid on fousel oil.

Acts powerfully on arterial spasm.

Dose— $\frac{1}{2}$ to 1 minim. The vapour of 2 to 5 minims may be inhaled; it may be swallowed in the form of capsule.

AMYLUM (Starch)—From Graminaceæ.

Starch procured from the seeds of common wheat, *Triticum sativum* (*Triticum vulgare*), from maize (*Zea Mays*), and rice (*Oryza sativa*), in white powder or in columnar masses.

Dietetic and Demulcent. Antidote in poisoning by iodine.

In addition to the following, it enters into the suppositories of morphine with soap, and tannic acid with soap, and compound tragacanth powder.

Glycerinum Amyli 1 to 8. 1 in $10\frac{1}{4}$ by weight.

A translucent jelly, prepared by heating 1 oz. starch, 5 oz. glycerine, and 3 oz. distilled water.

An emollient Application for External Use.

Enters into 3 suppositories.

Mucilago Amyli 12 grs. in 1 oz.

A thick, translucent mucilage, prepared by boiling 120 grs. starch with 10 oz. distilled water for a few minutes.

As a basis for enemas, into four of which it enters, *i.e.*, Aloes, Magnesii Sulphatis, Opii, and Terebinthinæ.

Preparations of iodine should not be ordered with starch.

ANETHI FRUCTUS (Dill Fruit)—Umbelliferæ.

The oval, flat, brown, dried, seed-like fruit, $\frac{1}{8}$ th of an inch long, with an aromatic odour, of *Pucedanum graveolens* (*Anethum graveolens*).

Carminative. Dose—10 to 60 grs., in powder.

Aqua Anethi 1 lb. to 1 gallon.

A colourless liquid, prepared by distilling 1 gallon from 1 lb. dill fruit and 2 gals. water.

Dose $\frac{1}{2}$ to 2 oz. for adults. A favourite drug in the colic of infants. 1 to 2 drs. for a child 1 year old.

Oleum Anethi

The pale yellow oil, distilled in Britain from Dill fruit.

Antispasmodic and Carminative. Dose—1 to 4 minims.

ANISI FRUCTUS (Anise Fruit)—Umbelliferæ.

The dried fruit of *Pimpinella Anisum*, $\frac{1}{8}$ th inch long, ovoid-oblong, greyish brown, and covered with hairs.

Antispasmodic and Carminative.

Conium Fruit is distinguished from Anise by its consisting of single mericarps, which are smooth and grooved.

ANISI STELLATI FRUCTUS (Star-Anise Fruit)—Magnoliaceæ.

The dried fruit of *Illicium anisatum*, from China, consisting of eight boat-shaped carpels arranged in the form of a star.

Antispasmodic and Carminative.

Aqua Anisi 1 lb. to 1 gallon.

A colourless water, obtained by distilling 1 gallon from 2 gallons water and 1 lb. anise fruit—(~~not~~ not star-anise).

Carminative and Antispasmodic.

Dose—1 to 2 drs. for a child 1 year old.

Oleum Anisi

The colourless or very pale yellow oil distilled in Europe from anise fruit, or in China from star-anise fruit.

~~Anise~~ Anise oil congeals at about 55° F.; star-anise oil at about 33° F.

Antispasmodic and Carminative. Dose—1 to 4 minims.

IN—Essentia Anisi and Tinct. Camphoræ Co., and Tinct. Opii Ammon.

Essentia Anisi 1 in 5.

The colourless solution, prepared by mixing 1 oz. oil of anise with 4 oz. rectified spirit.

Carminative and Antispasmodic.

Dose—10 to 20 minims. For a child 1 year old, 3 minims.

ANTHEMIDIS FLORES (Chamomile Flowers)—Compositæ.

The dried single and double flower-heads of *Anthemis nobilis*, resembling dried daisy heads, from cultivated plants.

An Aromatic Stimulant and Bitter Tonic.

Extractum Anthemidis

A soft extract, prepared by evaporating a decoction of flowers, and adding 15 minims of oil of chamomile for every pound of flowers. ~~is~~ This is the only extract containing oil.

Dose—2 to 10 grs.

Infusum Anthemidis $\frac{1}{2}$ oz. to $\frac{1}{2}$ pint. ($\frac{1}{4}$ hour).

Chamomile flowers $\frac{1}{2}$ oz. infused in 10 oz. boiling water.

Dose—1 to 4 oz. The warm infusion is Emetic in full doses.

oleum Anthemidis

The greenish blue or yellowish liquid oil distilled in Britain from chamomile flowers.

Used in making the extract.

Dose—1 to 4 minims, on sugar or in mucilage.

ANTIMONIUM NIGRUM PURIFICATUM Sb_2S_3

Purified black antimony, in the form of a greyish-black powder, being the native sulphide purified from siliceous matter by fusion, and, if necessary, from arsenic by maceration with solution of ammonia.

Used to make Antim. Sulphuratum and Liq. Antim. Chloridi.

Antimonii Oxidum Sb_2O_3

A greyish-white powder, prepared by pouring a solution of chloride of antimony into water, washing the oxychloride thus formed, and decomposing it by carbonate of sodium.

Diaphoretic and Emetic.

Dose—1 to 4 grs. For a child 1 year old $\frac{1}{6}$ to $\frac{1}{4}$ gr.

Used in the preparation of Antimon. Tartaratum, and in

pulvis Antimonialis (Antimonial Powder) 1 in 3.

A substitute for James's powder, consisting of oxide of antimony 1 oz., and phosphate of calcium 2 oz.

Acts like the Oxide, only weaker.

Dose—3 to 5 grs. For a child 1 year old $\frac{1}{4}$ to $\frac{1}{2}$ gr.

James's powder is prepared by mixing 1 lb. of antimony with 2 lbs. of phosphate of calcium and 1 lb. of sugar.

Antimonium Sulphuratum Sb_2S_3 with Sb_2O_3

An orange-red powder, known as sulphurated antimony, prepared by boiling black antimony with sublimed sulphur and solution of soda, adding diluted sulphuric acid to the solution before it cools, collecting and washing the precipitate.

Alterative, Emetic, and Diaphoretic. Dose—1 to 5 grs.

IN—*Pilula Hydrargyri Subchloridi Composita*—(1 in 5).

Liquor Antimonii Chloridi SbCl_3 1 lb. to 1 quart.

A heavy, reddish liquor, prepared by dissolving purified black antimony in hydrochloric acid, and concentrating. Known formerly as Butter of Antimony.

Caustic. Not used internally. It contains 36 per cent. of Chloride of Antimony. Used in making Antim. Oxid.

Antimonium Tartaratum $(\text{KSbOC}_4\text{H}_4\text{O}_6)_2, \text{H}_2\text{O}$

(Tartarated Antimony) Synonyms—Tartar Emetic; Antimonii Potassiotartras; Antimonium Tartarizatum). An oxytartrate of antimony and potassium. In colourless, transparent crystals, with triangular facets; soluble in water; prepared by boiling together oxide of antimony and acid tartrate of potassium in water, filtering, drying, and collecting the crystals which form in the liquid.

Emetic, Cardiac Depressant, Expectorant.

Dose—As an Emetic, 1 to 2 grs. (For a child 1 year old $\frac{1}{8}$ gr.) Diaphoretic, $\frac{1}{16}$ to $\frac{1}{8}$ gr.; as an Expectorant, $\frac{1}{8}$ to $\frac{1}{4}$ gr. Given in solution in water.

Unguentum Antimonii Tartarati 1 part in 5.

A white ointment, prepared by thoroughly mixing tartar emetic $\frac{1}{4}$ oz., and simple ointment 1 oz.

Vesicant and Rubefacient.

Vinum Antimoniale (Antimonial Wine) 2 grs. in 1 oz.

Tartar emetic, 40 grs., dissolved in sherry, 1 pint; making a pale, yellowish-brown liquid.

Dose—5 to 60 minims. For a child 1 year old, 3 minims as an Expectorant, and 15 mins. as an Emetic.

APOMORPHINÆ HYDROCHLORAS $\text{C}_{17}\text{H}_{17}\text{NO}_2\text{HCl}$

(Hydrochlorate of Apomorphine). The hydrochlorate of an alkaloid, obtained by heating morphine or codeine in sealed tubes with HCl .; in white acicular crystals, turning green on exposure to light and air, and soluble in 50 parts of water.

Powerfully Emetic and Expectorant.

Dose—Emetic (by mouth), $\frac{1}{2}$ – $\frac{2}{3}$ gr.; hypodermically, $\frac{1}{10}$ gr. As an Expectorant (by mouth), $\frac{1}{8}$ gr., in mixture.

Injectio Apomorphinæ Hypodermica 1 in 50.

A fresh solution of 2 grs. hydrochlorate of apomorphine in 100 minims of camphor water.

Dose—2 to 8 minims by subcutaneous injection.

AQUA (Water) H_2O

Natural water, as pure as can be obtained—filtered if necessary. In dispensing prescriptions, *aqua* should always mean distilled water. *omit*

Aqua Destillata (Distilled Water) H_2O

Water distilled from a copper still with a block-tin worm.

ARGENTUM PURIFICATUM (Refined Silver) **Ag**

Used in preparing nitrate of silver. In leaf, for the coating of pills, and in the vessels used in making caustic potash. *omit*

Argenti Nitras (Synonym—Lunar Caustic). $AgNO_3$

In flat, colourless crystals, or white rods. Prepared by evaporating a solution of refined silver in nitric acid, and drying the crystals. To make the rods commonly known as "Lunar Caustic," the fused crystals are poured into moulds; and to prepare "Toughened Nitrate of Silver," 5 per cent. of nitre is added to the nitrate of silver before fusion.

Caustic, Astringent, and Nerve Tonic.

Dose— $\frac{1}{8}$ to $\frac{1}{3}$ gr. (in pill). Sometimes, 1 gr. in stomach affections.

As a strong caustic lotion for wounds, ulcers, &c., 1 dr. to 1 oz. As a lotion for ophthalmia in infants, 8 grs. to 1 oz. As an injection for the urethra, 2 grs. to 1 oz.

All solutions of caustic should be made with distilled water, and should not contain any trace of organic matter. Sometimes, however, the salt is dissolved in Spt. Æther. Nit.

Argenti et Potassii Nitras (Synonym—Mitigated Caustic).

White cylindrical rods or cones, prepared by fusion of 1 oz. nitrate of silver and 2 oz. nitrate of potassium.

Caustic.

Argenti Oxidum Ag_2O

The olive-brown powder precipitated, on adding a solution of nitrate of silver to lime water.

Tonic and Antispasmodic. Dose— $\frac{1}{2}$ to 2 grs., in pill. Pills containing this salt with organic matter, as extracts, alkaloids, &c., rapidly decompose and sometimes explode.

ARMORACIÆ RADIX (Horseradish Root)—Cruciferae.

The fresh root of Cochlearia Armoracia, from plants cultivated in Britain, and most active in autumn or early spring. It has

often been unreasonably confounded with aconite. A comparison shows—

Aconite Root.

To be smaller, distinctly tapering to a point, brown on the exterior, odourless, and leaving a tingling sensation on being chewed.

Horseradish Root.

To be larger, much longer, more uniform in circumference, white or cream coloured externally, with strong odour after being scraped, and with a characteristic taste.

Diuretic, Stimulant, and Sialagogue.

Spiritus Armoraciæ Compositus 1 in 8.

A colourless liquid, prepared by mixing 20 oz. of scraped horseradish root, 20 oz. bitter-orange peel, $\frac{1}{2}$ oz. nutmeg, 1 gln. proof spirit, and 3 pints of water, and distilling 1 gln. S.G. .920.

Stimulant and Diuretic. Dose—1 to 2 drachms.

ARNICÆ RHIZOMA (Arnica Rhizome)—Compositæ.

The dried rhizome and rootlets of *Arnica montana*, from 1 to 3 inches long, and $\frac{1}{8}$ inch thick, round, twisted, and furnishing numerous long, brown, wiry fibres. Its peppery taste and peculiar odour distinguish it from Senega, Serpentary, and Valerian, which it somewhat resembles.

Tinctura Arnicæ 1 oz. to 1 pint.

A brandy-coloured liquid, obtained by the maceration and percolation of 1 oz. arnica rhizome with 1 pint rectified spirit.

Gastric Stimulant. Dose— $\frac{1}{2}$ to 1 drachm. Chiefly used as a lotion for bruises, 1 oz. to 40 oz. water.

Arsenic (*Vide* Acid. Arseniosum.)

ASAFŒTIDA (Asafœtida)—Umbelliferæ.

The fetid gum-resin, in irregular softish masses or tears, of a dull yellow and often pinkish colour, obtained from incisions into the living root of *Ferula Narthex* (*Narthex Asafœtida*) and *Ferula Scorodosma*, and probably other species.

Stimulant and Antispasmodic. Dose—5 to 20 grs.

Enema Asafœtidæ 30 grs. to 4 oz.

Prepared by rubbing 30 grs. asafœtida with 4 oz. distilled water, making a whitish emulsion.

Pilula Aloes et Asafœtidæ 1 in 4.

Socotrine aloes, asafœtida, hard soap, and confection of roses, of each 1 oz. well beaten together.

Cathartic and Antispasmodic. Dose—5 to 10 grs.

Pilula Asafœtidæ Composita 1 in $3\frac{1}{2}$. (Synonym—*Pilula Galbani Composita*).

Asafœtida, galbanum, and myrrh, of each 2 oz.; treacle, 1 oz.; heated by means of a water-bath, and stirred until of a uniform consistence.

Antispasmodic in hysteria. Dose—5 to 10 grs.

can pure asafœtida/pills stick to each

Spiritus Ammoniae Foetidus 33 grs. Asafoetida in 1 oz.

A clear, faintly-yellow liquid, prepared by distilling a mixture of asafoetida $1\frac{1}{2}$ oz. and rectified spirit 15 oz., and adding to the distilled spirit 2 oz. strong solution of ammonia, with as much rectified spirit as will make the product measure 20 oz.

Dose— $\frac{1}{2}$ to 1 drachm, diluted with water.

Tinctura Asafoetidæ $2\frac{1}{2}$ oz. in 1 pint. ($54\frac{1}{2}$ grs. in 1 oz.)

A bright brown liquid, prepared by macerating $2\frac{1}{2}$ oz. asafoetida in 1 pint rectified spirit.

Dose— $\frac{1}{2}$ to 1 drachm.

ATROPINA (Atropine) $C_{17}H_{23}NO_3$ (Synonym—Atropia).

An alkaloid obtained from belladonna in the following manner :—A strong tincture is made by macerating belladonna root in rectified spirit ; on adding slaked lime to this the alkaloid is set free along with colouring matters ; sulphuric acid, poured upon the precipitate, forms sulphate of atropine, which is again decomposed by carbonate of potassium, and, on purification by charcoal, chloroform, and spirit, the alkaloid is obtained in colourless circular crystals.

Sedative and Anodyne. Dose— $\frac{1}{50}$ gr.

Lamellæ Atropinæ (Discs of Atropine).

Discs of gelatine with some glycerine, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{5000}$ gr. sulphate of atropine.

Ingumentum Atropinæ 8 grs. in 1 oz.

A white ointment, prepared by dissolving 8 grs. of atropine in $\frac{1}{2}$ dr. of spirit, and mixing with 1 oz. benzoated lard.

A Local Anodyne.

Atropinæ Sulphas

A colourless crystalline powder, obtained by dissolving atropine in very dilute sulphuric acid, and evaporating.

Acts like atropine, and is very soluble. A powerful Poison.

Liquor Atropinæ Sulphatis 1 in 100.

A colourless solution of 9 grs. sulphate of atropine in $16\frac{1}{2}$ s. camphor water. Containing no spirit, its introduction into the eye does not cause pain.

Dose—1 to 4 minims, or two minims hypodermically.

AURANTII CORTEX (Bitter-Orange Peel)—Aurantiaceæ.

(Synonym—Aurantii Pericarpium). The dried thin outer part of the rind or pericarp of the bitter or Seville orange *trus vulgaris* (*Citrus Bigaradia*).

An Aromatic Bitter and Flavouring ingredient.

In addition to the preparations bearing its name, it occurs in Infus. Geniæ Co., Spirit. Arnica Co., Tr. Cinchonæ Co., and Tr. Gentianæ Co.

Contains 2 strong yon

... come with tincture -

Infusum Aurantii $\frac{1}{2}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{4}$ hour).

Bitter-orange peel $\frac{1}{2}$ oz. infused in boiling water $\frac{1}{2}$ pint.

A mild Stomachic Tonic. Dose—I to 2 oz.

Infusum Aurantii Compositum $\frac{1}{4}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{4}$ hour).

Prepared by infusing in 10 oz. boiling water, $\frac{1}{4}$ oz. bitter-orange peel, 56 grs. fresh lemon peel, and 28 grs. of cloves.

Dose—I to 2 oz.

Syrupus Aurantii 1 in 8.

1 oz. tincture of orange peel and 7 oz. simple syrup, mixed.

Dose—I dr.

IN—Confectio Sulphuris.

Tinctura Aurantii 2 oz. to 1 pint.

A golden, sherry-coloured tincture, prepared by macerating 2 oz. bitter-orange peel in 1 pint proof spirit.

An agreeable Bitter Tonic. Dose—I to 2 drs.

IN—Mist. Ferri Aromat.; Tinct. Quininæ; Syr. Aurant.; Troch. Sulph.

Aurantii Fructus (Bitter Orange)—Aurantiaceæ.

The ripe fruit of *Citrus vulgaris* (*Citrus Bigaradia*).

Action as above. Used in preparing the following:—

Tinctura Aurantii Recentis 6 oz. to 1 pint.

Prepared by macerating 6 oz. of the coloured part of the *fresh* rind of the bitter orange in 1 pint of rectified spirit.

Acts like the Tinct. Aurantii, but, having more oil in the fresh peel, its flavour is stronger.

Dose—I to 2 drs.

Vinum Aurantii 10 or 12 per cent. of alcohol.

Wine of a golden sherry colour, made in Britain by the fermentation of a saccharine solution, to which the fresh peel of the bitter orange has been added.

An agreeable Bitter and Stimulating Tonic. Dose— $\frac{1}{2}$ to 2 oz.

IN—Vinum Quininæ and Vinum Ferri Citratis.

Aqua Aurantii Floris (Orange-Flower water).

The nearly colourless fragrant distilled water of the flowers of the bitter and sweet orange trees.

Used for flavouring Mist. Olei Ricini.

Syrupus Aurantii Floris 1 in 6 $\frac{3}{4}$.

Prepared by dissolving 3 lb. of sugar in 16 oz. of distilled water, and adding 8 oz. of orange-flower water.

A sweet, colourless syrup, used for flavouring.

BALSAMUM PERUVIANUM (Balsam of Peru)—Leguminosæ.

A dark-brown, viscid, liquid balsam, exuded from the trunk of *Myroxylon Pereiræ* (*Toluifera Balsamum*), after the bark has been beaten, scorched, and removed.

Expectorant. Externally—a stimulant to ulcers.

Dose—10 to 15 minims, in mucilage or with beaten-up egg.

BALSAMUM TOLUTANUM (Balsam of Tolu) Leguminosæ.

A soft, fragrant, solid balsam, exuding from incisions in the bark of *Myroxylon Toluifera* (*Toluifera Balsamum*).

Expectorant. Dose—10 to 20 grs., with mucilage or egg.

IN—Pil. Phosphori and Tr. Benzoini Co. and

Syrupus Tolutanus 1 in 29.

A colourless syrup, prepared by boiling $1\frac{1}{4}$ oz. balsam of tolu in 1 pint distilled water, filtering, and adding 2 lb. sugar.

Dose—1 dr. Chiefly used to sweeten cough mixtures.

Tinctura Tolutana $2\frac{1}{2}$ oz. to 1 pint.

A bright, reddish-brown liquid, prepared by dissolving $2\frac{1}{2}$ oz. balsam of tolu in 1 pint of rectified spirit.

A Stimulating Expectorant. Dose—20 to 40 minims.

IN—Morphine, Tannin, Opium, and "Morphine and Ipecac." lozenges.

BEBERINÆ SULPHAS (Sulphate of Beberine)—Lauraceæ.

The sulphate of an alkaloid, in brown, thin, translucent scales, prepared from *Nectandra* bark, by treating it with weak sulphuric acid, precipitating the alkaloid with ammonia and lime, and, after acting on it with spirit and dilute sulphuric acid, evaporating, and drying the crystals under 140° . *omit*

Tonic and Antiperiodic. Dose—1 to 10 grs.

BELÆ FRUCTUS (Bael Fruit)—Aurantiacæ.

The dried, half-ripe fruit of *Ægle Marmelos*, about the size of an orange, with a hard rind of greyish-brown colour, usually imported in dried, twisted slices. *omit*

Astringent.

Extractum Belæ Liquidum 1 in 1.

A deep brown-coloured liquid, prepared by evaporating an infusion of 1 pound bael fruit, made with 12 pints of cold distilled water, to 14 oz., and then adding 3 oz. rectified spirit.

Dose—1 to 2 drs., in Dysentery.

BELLADONNÆ FOLIA (Belladonna Leaves)—Solanaceæ.

The *fresh* ovate, acute, smooth leaves and young branches of deadly nightshade (*Atropa Belladonna*), also the leaves separated from the branches and *dried*, from wild or cultivated British plants, gathered when the fruit has begun to form.

Narcotic and Mydriatic. A powerful Poison.

Extractum Belladonnæ

A soft, dark-green extract, with a peculiar heavy odour, prepared from the juice of the fresh young leaves and branches of belladonna by exactly the same process as that used in making extract of aconite, for which see page 137.

Anodyne and Sedative. Dose $\frac{1}{4}$ to 1 gr., in pill.

~~It~~ Must not be confounded with the stronger alcoholic extract. When ordering this extract, the writer suggests the appending of the abbreviation Virid. to distinguish it from the alcoholic.

Succus Belladonnæ

The brownish juice of the young fresh leaves and branches of belladonna, with the addition of $\frac{1}{3}$ its bulk of rectified spirit.

Action—Anodyne. Dose—5 to 15 minims. (Given in incontinence of urine and whooping cough).

Tinctura Belladonnæ 1 oz. to 1 pint.

An olive-brown liquid, prepared by the maceration and percolation of 1 oz. *dried* belladonna leaves with 1 pint proof spirit.

Dose—5 to 20 minims. One minim for a child 1 year old.

BELLADONNÆ RADIX (Belladonna Root)—Solanaceæ.

The branched, whitish root, 1 to 2 feet long, of wild or cultivated British plants of *Atropa Belladonna*; carefully dried or imported in the dry state from Germany.

In action resembling the leaves.

Used in preparing Atropine and the following—

Extractum Belladonnæ Alcoholicum

A dark semi-solid extract, prepared by evaporating on a water-bath a strong tincture of dried belladonna root.

Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr.

Emplastrum Belladonnæ 1 in 5.

Prepared by melting together on a water-bath 4 oz. *alcoholic* extract of belladonna and 8 oz. each of soap and resin plasters.

A Local Anodyne.

Linimentum Belladonnæ 1 part in 1 $\frac{1}{2}$.

A light yellowish-brown coloured liquid, prepared by the maceration and percolation of 20 oz. belladonna root in No. 40 powder, with 30 oz. rectified spirit and 1 oz. camphor.

A powerful Anodyne.

Unguentum Belladonnæ 1 in 10.

A brownish ointment, made by rubbing 50 grs. of *alcoholic* extract of belladonna with 1 oz. benzoated lard.

A soothing application to Inflamed Piles.

BENZOINUM (Benzoin)—Styracææ.

The balsamic resin, in mottled masses or light-brown lumps

made up of tears obtained by making deep incisions into the bark of *Styrax Benzoin*, and probably other species.

Diuretic and Expectorant, but seldom used internally.

IN—*Adeps Benzoatus*, *Ungt. Cetacei*, and the following:—

Tinctura Benzoini Composita 2 oz. to 1 pint.

A dark reddish brown liquid, prepared by macerating 2 oz. benzoin, $1\frac{1}{2}$ oz. storax, $\frac{1}{2}$ oz. balsam of tolu, and 160 grs. Socotrine aloes in q.s. rectified spirit, to make 1 pint.

A Stimulating Expectorant. Commonly known as Friar's balsam, and used as a protective coating for fresh wounds.

Dose— $\frac{1}{2}$ to 1 dr. in emulsion. Water decomposes it.

Benzoic Acid and Preparations (See *Acidum Benzoicum*).

BISMUTHUM (Bismuth)—**Bi**

A crystalline metal used in preparing the following:—

Omit

BISMUTHUM PURIFICATUM (Purified Bismuth).

In shining crystalline masses, of a greyish-white colour, with a roseate tinge, produced by fusion of the impure metal with cyanide of potassium, sulphur, and subsequently with dried carbonates of sodium and potassium.

Omit

Bismuthi Carbonas ($\text{Bi}_2\text{O}_2\text{CO}_3$) $_2\text{H}_2\text{O}$

(Synonym—Oxycarbonate of Bismuth). A white powder, prepared by dissolving bismuth in nitric acid, and acting on the solution by carbonate of ammonium, when the carbonate of bismuth is precipitated.

Antacid and Gastric Sedative. Dose—5 to 20 grs.

Bismuthi Citras $\text{BiC}_6\text{H}_5\text{O}_7$

A white powder, prepared by heating subnitrate of bismuth with nitric acid till dissolved, and adding water, and into this liquid pouring a solution of bicarbonate of sodium which has been boiled with citric acid, and purifying the resulting precipitate of citrate of bismuth.

Omit

Same action as Bismuthi Carbonas. Dose—2 to 5 grs.

Liquor Bismuthi et Ammonii Citratis 3 grs. Bi_2O_3 in 1 dr. (Synonym—Liquor Bismuthi).

A colourless solution, prepared by rubbing 800 grs. citrate of bismuth with as much solution of ammonia as will dissolve it, and adding up to 20 oz. with distilled water.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

Bismuthi et Ammonii Citras

Small, shining translucent scales, obtained by evaporating liquor bismuthi, and allowing the concentrated liquid to dry upon glass or porcelain plates.

Omit

Dose—2 to 5 grs., as a Gastric Sedative.

Bismuthi Oxidum Bi_2O_3

A dull lemon-yellow powder, prepared by boiling 1 lb. of subnitrate of bismuth with 4 pints of solution of soda, washing and drying the residue.

Action and dose same as Bismuthi Carbonas.

Bismuthi Subnitrates $\text{BiONO}_3, \text{H}_2\text{O}$

(Synonym—Oxynitrate of Bismuth). A heavy, white powder, prepared by dissolving bismuth in nitric acid, and pouring the solution into distilled water, when the salt is thrown down in minute crystalline scales.

Action and dose same as Bismuthi Carbonas.

Trochisci Bismuthi 2 grs. in each.

Composed of subnitrate of bismuth, carbonate of magnesium, carbonate of calcium, sugar, powdered gum acacia, mucilage of gum acacia, and rose water.

Dose—1 to 6 lozenges.

BORAX (Borax) $\text{Na}_2\text{B}_4\text{O}_7, 10\text{H}_2\text{O}$

(Synonyms—Sodæ Biboras; Pyroborate of Sodium). A native salt, in large, transparent, colourless crystals. Can be also obtained by boiling boric acid and carbonate of sodium.

Antiseptic, Emmenagogue, and Diuretic. Dose—5 to 40 grs.

Used in making Acid. Boric.

Glycerinum Boracis 1 to 6. (1 in 8 by weight.)

A colourless liquid, prepared by dissolving 1 oz. borax in 4 oz. glycerine and 2 oz. distilled water.

Used for its soothing action on diseased mucous surfaces.

Mel Boracis 46 grains in 1 oz.

A honey-like mixture of borax 60 grs., glycerine 30 grs., and clarified honey 480 grs.

Action similar to glycerine of borax.

BROMUM (Bromine) **Br**

A dark-brown, pungent smelling liquid element obtained from sea water, and some saline springs.

Caustic and Disinfectant. Not used internally.

Hydrobromic Acid, Ammonii, Potassii, and Sodii Bromid. See under respective headings.**BUCHU FOLIA** (Buchu Leaves)—Rutaceæ.

The dried leaves of three plants—*Barosma betulina*, *Barosma crenulata*, *Barosma serratifolia*. Small, pale-green, shining, and smooth leaves, with a powerful minty odour. Marked with pellucid dots at the indentations and apex.

A stimulating Diuretic. Dose 10 to 30 grs.

Infusum Buchu $\frac{1}{2}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

$\frac{1}{2}$ oz. bruised buchu leaves infused in 10 oz. boiling water.

Dose 1 to 4 oz.

Tinctura Buchu $2\frac{1}{2}$ oz. to 1 pint.

A brownish-green liquid, prepared by the maceration and percolation of $2\frac{1}{2}$ oz. buchu leaves with 1 pint proof spirit.

Dose—1 to 2 drs.

BUTYL-CHLORAL HYDRAS Hydrate of Butyl-Chloral
 $C_4H_5Cl_3O, H_2O$ (Synonyms—Croton-Chloral Hydrate, wrongly so called; Hydrous Butyl-Chloral).

Pearly white crystalline scales, with an odour like hydrate of chloral, produced by the action of dry chlorine on cooled aldehyd, separated by fractional distillation, and solidified by the addition of water.

Hypnotic and Anodyne to fifth nerve. Dose—5 to 15 grs.

CADINUM OLEUM (Oil of Cade)—Coniferæ.

(Synonyms—'Huile de Cade'; Juniper Tar Oil). The brownish-black oily empyreumatic liquid obtained by the destructive distillation of the woody portions of Juniperus Oxycedrus and other species.

Stimulating application in Scaly Skin Diseases.

CAFFEINA (Caffeine) $C_8H_{10}N_4O_2, H_2O$

(Synonyms—Caffeia; Theina; Guaranina).

An alkaloid in colourless, *inodorous* silky crystals, obtained from the dried leaves of Camellia Thea, or the dried seeds of Coffea arabica, by evaporating aqueous infusions deprived of astringent and colouring matters.

Cardiac Tonic and Diuretic. Dose—1 to 5 grs.

Caffeinæ Citras $C_8H_{10}N_4O_2, H_3C_6H_5O_7$

A white, *inodorous* powder, prepared by dissolving 1 oz. caffeine and 1 oz. citric acid in 2 oz. water, and evaporating.

Cardiac Tonic and Diuretic. Dose—2 to 10 grs.

CAJUPUTI OLEUM (Oil of Cajuput)—Myrtaceæ.

A bright-green mobile oil, with strong camphoraceous odour, distilled from the leaves of Melaleuca minor (M. Cajuputi).

Diffusible Stimulant and Antispasmodic. Dose 1 to 4 mins.

Spiritus Cajuputi 1 in 50.

Oil of Cajuput 1 oz. mixed with rectified spirit 49 oz.

Dose— $\frac{1}{2}$ to 1 drachm.

Ol. Cajuputi enters into Linimentum Crotonis.

CALAMINA PRÆPARATA (Prepared Calamine)

omit (Synonym—Lapis Calaminaris Præparata). A pink powder, obtained by calcining native zinc carbonate, and freeing it from gritty particles by elutriation. Not used internally.

Unguentum Calaminæ 1 to 5.

A reddish ointment, prepared by mixing 1 oz. calamine with 5 oz. benzoated lard. (Known as Turner's Cerate.)

A protective application to excoriated surfaces.

CALCII CARBONAS PRÆCIPITATA CaCO_3

D (Precipitated Carbonate of "Calcium") (Synonyms—Calcis Carbonas Præcipitata; Precipitated Carbonate of Lime). A white crystalline powder, being one of the four official carbonates of calcium; prepared by mixing boiling solutions of carbonate of sodium and chloride of calcium.

Antacid and mildly Astringent. Dose—10 to 60 grs.


IN—Trochisci Bismuthi, 4 grs. in each.

The other carbonates are—Ureta, Creta Præparata, and Marmor Album.

Calcii Chloridum (Chloride of Calcium) $\text{CaCl}_2, 2\text{H}_2\text{O}$

In white agglutinated masses, prepared by neutralising hydrochloric acid with chalk, adding a little solution of chlorinated lime and slaked lime, and evaporating the solution to dryness, and heating the residue at about 400° .

Alterative in Scrofula and Phthisis. Dose—3 to 10 grs.

 Should not be confounded with the so-called chloride of lime.

Liquor Calcii Chloridi 88 grs. to 1 oz.

A colourless solution of chloride of calcium 88 grs., in 1 oz. distilled water.

Dose—15 to 50 minims.

Calcii Hypophosphis $\text{Ca}(\text{PH}_2\text{O}_2)_2$ (Synonym — Hypophosphite of Lime).

A white, pearly, crystalline salt, prepared by heating phosphorus with slaked lime and water, and evaporating the solution after separating uncombined lime by carbonic acid gas.

Nervine Tonic. Dose—5 to 10 grs.

Calcii Phosphas (Synonym—Phosphate of Lime) $\text{Ca}_3(\text{PO}_4)_2$

A light white amorphous powder, insoluble in water, prepared by dissolving bone ash in hydrochloric acid and water and adding ammonia until the phosphate is thrown down.

Nervine Tonic. Dose—10 to 20 grs.

IN—Pulv. Antimonialis, 2 parts in 3. For bone ash see Os Ustum.

Calcii Sulphas $\text{CaSO}_4, 2\text{H}_2\text{O}$

Native Sulphate of Calcium (or Sulphate of Lime) rendered nearly anhydrous by heat.

Only used to make Calx sulphurata.

CALX (Lime) **CaO**

Oxide of calcium in compact whitish masses, obtained by burning chalk or limestone CaCO_3 .

Caustic. Not used internally.

Calcii Hydras (Hydrate of Calcium) **Ca(HO)₂**

(Synonyms—Calcis Hydras ; Hydrate of Lime ; Slaked Lime).

A white powder, prepared by adding 1 of water to 2 of lime and sifting. It acts like Calx.

Liquor Calcis (Solution of Lime) $\frac{1}{2}$ gr. in 1 oz.

(Synonyms — Aqua Calcis ; Lime Water). Prepared by washing slaked lime 2 oz., adding water 1 gallon, and decanting the clear colourless liquid.

Antacid and Astringent.

Dose—I to 4 oz., in milk ; $\frac{1}{2}$ to 1 dr. for a child 1 year old.

Used in the preparation of *Argent. Oxid.*, *Liniment. Calcis*, *Lotio Hydrarg. Flava*, *Lotio Hydrarg. Nigra*.

Liquor Calcis Saccharatus 7 grs. in 1 oz.


(Saccharated Solution of Lime.). Prepared by adding slaked lime 1 oz., sugar 2 oz., to water 1 pint, mixing and decanting.

Same as Liquor Calcis in action. Dose—15 to 60 minims.

Linimentum Calcis 1 in 2.

Lime water and olive oil, of each 2 oz. (mixed), forming a thick, whitish emulsion, known as Carron oil.

Sedative application to burns and scalds.

 The original Carron oil was made with Linseed oil.

Calx Chlorinata CaCl_2 , CaCl_2O_2 , or CaOCl_2

(Chlorinated Lime) A dirty-white powder, obtained when slaked lime is exposed to the action of chlorine gas, as long as the latter is absorbed. It is known as bleaching powder. It has bleaching and disinfecting properties, and is astringent.

Used in the preparation of Chloroform.

Liquor Calcis Chlorinatae 1 lb. to 1 gal., 2 per cent. Cl.

A colourless filtered solution of chlorinated lime in water.

Antiseptic. Dose—10 to 30 mins.

Chiefly used as a deodoriser.

Vapor Chlorig (Inhalation of Chlorine).

2 oz. chlorinated lime, moistened with a sufficiency of cold water, so that the vapour arising may be inhaled.

Calx Sulphurata (Sulphurated Lime)

(Synonyms—Calcii Sulphidum ; Sulphide of Calcium). A dirty-white, foul-smelling powder, containing not less than 50 per cent. of sulphide of calcium (CaS), prepared by heating to redness in a crucible 7 oz. sulphate of calcium and 1 oz. wood charcoal.

Antisuppurative. Dose— $\frac{1}{10}$ to 1 grain in pill.

CALUMBÆ RADIX (Calumba Root)—Menispermaceæ.

The dried root (cut in round or oval flat yellow slices, with radiating lines) of *Jateorhiza Calumba* (*Cocculus palmatus*).

A Bitter Tonic. Dose—5 to 20 grs. in powder.

Extractum Calumbæ

A dark, soft extract, prepared by evaporating a tincture of calumba root made with proof spirit.

Dose—2 to 10 grs., in pills.

Infusum Calumbæ $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

$\frac{1}{2}$ oz. calumba root macerated in $\frac{1}{2}$ pint of *cold* water.

Dose—I to 2 oz.

Tinctura Calumbæ $2\frac{1}{2}$ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. calumba root with 1 pint of proof spirit.

Dose— $\frac{1}{2}$ to 2 drs.

As calumba root and its preparations do not contain any tannin, they can, like quassia, be prescribed with all the preparations of iron. Cold water is used in making the infusion, lest any of the starch should be extracted.

In addition to the above, calumba root enters into *Mist. Ferri Aromat.*

CAMBOGIA (Gamboge)—Guttiferæ.

A gum-resin in yellow cylindrical pieces, obtained from *Garcinia Hanburii* (*Garcinia Morella*, *var. pedicellata*).

A Hydragogue Drastic Cathartic. Dose—I to 4 grs., in pill.

Pilula Cambogiæ Composita 1 in 6.

Composed of gamboge, Barbadoes aloes, compound cinnamon powder, of each 1 oz.; hard soap, 2 oz.; syrup, q.s.

Hydragogue Cathartic. Dose—5 to 10 grs.

CAMPHORA (Camphor)—Lauraceæ.

A stearoptene or volatile oil, in translucent, white, crystalline masses, obtained from the wood of *Cinnamomum Camphora* (*Camphora officinarum*), purified by sublimation in England.

Stimulant and Antispasmodic. Dose—I to 10 grs.

In addition to the preparations bearing the name, camphor enters into *Ungt. Hydrarg. Co.*, and into 11 of the 16 liniments of the *Pharmacopœia*.

Aqua Camphoræ

(Synonym—*Mistura Camphoræ*). $\frac{1}{2}$ gr. in 1 oz.

Prepared by immersing $\frac{1}{2}$ oz. camphor, tied in muslin, in 1 gallon water.

Only a vehicle for more active remedies.

IN—*Injectio Hypoderm.* *Apomorph.* and *Ergot.*, and *Liq. Atrop. Sulph.*

Linimentum Camphoræ 1 in 5 nearly.

A yellow, oily liquid, prepared by dissolving 1 oz. camphor in 4 oz. olive oil.

A Stimulating Application in chronic painful affections.

IN—*Lin. Chlorof.*, *Lin. Hydrarg.*, and *Lin. Tereb. Acet.*

*shall***Linimentum Camphoræ Compositum** 1 to 8. 1 in 9.

A faintly-yellowish liquid, prepared by dissolving $2\frac{1}{2}$ oz. camphor in 15 oz. rectified spirit, and adding 1 dr. oil of lavender and 5 oz. strong solution of ammonia.

A safe and effectual Rubefacient and Counter-irritant.

In absence of other remedies, it may be used as a general diffusible stimulant in 20 minim doses, largely diluted.

Spiritus Camphoræ 1 in 10.

Prepared by dissolving 1 oz. camphor in 9 oz. rectified spirit.

Dose—10 to 30 minims in emulsion.

Tinctura Camphoræ Composita $1\frac{1}{2}$ grs. camphor and 2 grs. opium in 1 oz. *cabot.*

A sherry-coloured liquid, known as Paregoric, prepared by macerating 40 grs. each, opium and benzoic acid with 30 grs. camphor and 30 minims oil of anise in 1 pint proof spirit.

Narcotic and Expectorant. Dose—15 to 60 minims.

CANELLÆ CORTEX (Canella Bark)—Canellaceæ. *Can.*

The bark of Canella alba, deprived of its corky layer and dried, in quills or curved pieces, with clove-like odour and peppery taste, yellowish-white within and buff externally.

An Aromatic Tonic, introduced to flavour Vinum Rhei.

Dose—10 to 30 grs., in powder.

CANNABIS INDICA (Indian Hemp)—Cannabinaceæ.

The dried flowering tops of the female plant of Cannabis sativa, from which the resin has not been removed, grown in India; in elongated compressed bundles of a greenish-brown colour, in which may be recognised the flowers, young branches, smaller leaves, and the well-known fruits commonly called hemp seeds. (Known in India as Gunjah or Ganga.)

Anodyne and Narcotic.

Extractum Cannabis Indicæ

A rich green resinous extract, prepared from the tops by macerating in spirit, and evaporating the tincture thus formed.

Anodyne and Narcotic, like Opium. Dose— $\frac{1}{4}$ to 1 grain.

Tinctura Cannabis Indicæ 1 oz. to 1 pint.

A deep-green liquid, prepared by dissolving 1 oz. of the extract in 1 pint rectified spirit.

Dose—5 to 20 minims, in mucilage or wine.

CANTHARIS (Cantharides)—Coleoptera.

The dried beetle Cantharis vesicatoria, about $\frac{3}{4}$ to 1 inch long, with bright metallic green wing covers; the powder is greyish-brown, with shining green particles.

Vesicant, Counter-irritant, and Diuretic.

Acetum Cantharidis 1 in 10.

A dark-brown coloured liquid, prepared from 2 oz. cantharides by digestion at 200°, and percolation with 18 oz. acetic acid and 2 oz. glacial acetic acid.

Epispastic. Not used internally.

Emplastrum Cantharidis 1 in 3.

A brownish substance, of the consistence of firm ointment with dark-green shining particles, prepared by heating 12 oz. cantharides (in powder), 7½ oz. yellow wax, 7½ oz. suet, 3 oz. resin, and 6 oz. lard. Known as blistering plaster.

Vesicant. Generally blisters in from 6 to 9 hours.

Emplastrum Calefaciens 1 in 24. (Warming plaster).

Prepared by adding to a strong infusion of 4 oz. of cantharides 4 oz. each of expressed oil of nutmeg, yellow wax and resin, 3 lbs. resin plaster, and 2 lbs. soap plaster previously heated mixing and making a firm plaster of a yellow colour.

A stimulating application, and known also as Warm Plaster.

Tinctura Cantharidis ¼ oz. to 1 pint.

A pale straw-coloured liquid, prepared by macerating ¼ oz. cantharides in 1 pint proof spirit.

Diuretic and Stimulant to the genito-urinary organs.

Dose—5 to 20 minims, diluted with a mucilaginous liquid.

Unguentum Cantharidis 1 to 7.

An ointment of a yellowish-brown colour, prepared by heating 1 oz. cantharides in 6 oz. olive oil, and after straining out the cantharides, adding 1 oz. yellow wax to the heated oil.

Rubefacient. Milder than Emplastrum Cantharidis.

Charta Epispastica (Blistering Paper).

Paper coated on one side with a mixture made by heating together white wax 4 oz., spermaceti 1½ oz., olive oil 2 oz., resin ¾ oz., cantharides 1 oz., with 6 oz. water, and adding Canada balsam ¼ oz. after rejecting the watery liquid.

Rubefacient and Vesicant. Acts like Emplastrum Cantharidis.

Collodium Vesicans (Blistering Collodion).

A thick liquid, prepared by adding 1 oz. pyroxylin to 20 oz. blistering liquid.

Vesicant. Like Emplastrum and the following :—

Liquor Epispasticus (Blistering Liquid) 1 in 4.

(Synonym—Linimentum Cantharidis).

A bright greenish-brown, ethereal liquid, prepared by percolating 5 oz. cantharides with 1 pint acetic ether.

CAPSICI FRUCTUS (Capsicum Fruit)—Solanaceæ.

A small oblong orange pod, containing flat white seeds, the fruit of *Capsicum fastigiatum*, known as Cayenne pepper.

A powerful Stimulant and Rubefacient, without blistering.

Dose— $\frac{1}{2}$ to 1 gr. 30 grs. in Delirium Tremens.

Tinctura Capsici $\frac{3}{4}$ oz. to 1 pint.

A brandy-coloured liquid, prepared by macerating and percolating $\frac{3}{4}$ oz. capsicum fruit with 1 pint rectified spirit.

Dose—10 to 20 minims diluted.

CARBO ANIMALIS (Animal Charcoal or Bone Black). *fruit*

The residue of bones which have been exposed to a red heat without the access of air, consisting principally of carbon and phosphate and carbonate of calcium.

Carbo Animalis Purificatus Product about 10 per cent.

A black powder, prepared by depriving animal charcoal of its salts, by digestion in hydrochloric acid, and calcining. *fruit*

Deodoriser, Bleacher, and Antidote in poisoning by alkaloids. Dose 20 to 60 grs.

CARBO LIGNI (Wood Charcoal).

In black, brittle, porous masses, prepared by exposing wood to a red heat in a confined space without access of air.

Deodoriser and Absorbent in fetid eructations.

Dose—20 to 60 grs. in powder ; or, sprinkled over foul sores.

Cataplasma Carbonis 1 in 28.

Powdered wood charcoal, $\frac{1}{2}$ oz. ; crumb of bread 2 oz. ; linseed meal, $1\frac{1}{2}$ oz. ; boiling water, 10 oz. Half of the charcoal is mixed with the poultice, and the remainder sprinkled over its surface. *crumb*

CARDAMOMI SEMINA (Cardamoms)—Zingiberaceæ.

The small, dried, ripe angular brown seeds of *Elettaria Cardamomum*, kept in their triangular pericarps till required.

Carminative and Antispasmodic. Dose—5 to 20 grs.

Tinctura Cardamomi Composita $\frac{1}{4}$ oz. to 1 pint.

A bright red liquid, prepared by macerating and percolating $\frac{1}{4}$ oz. cardamom seeds, $\frac{1}{4}$ oz. caraway fruit, 2 oz. raisins, $\frac{1}{2}$ oz. cinnamon, 55 grs. cochineal, with 1 pint proof spirit.

Carminative, and colouring agent. Dose— $\frac{1}{2}$ to 2 drs.

In addition to the Tincture, cardamom seeds enter into the following :—Ext. Col. Co., Pulv. Cinnam. Co., Pulv. Cretæ Arom., Tr. Gent. Co., Tr. Rhei, Vin. Aloes. ; and the Tincture itself enters into Dec. Aloes Co., Mist. Ferri Aromat., Mist. Sennæ Co., and Tr. Chloroformi Co.

CARUI FRUCTUS (Caraway fruit)—Umbelliferæ.

The minute brown aromatic seed-like fruits of *Carum Carui* tapering at each end, and marked with five ridges.

Carminative, Stimulant, and Antispasmodic.

In Confect. Opii and Piperis, Pulv. Opii Co., Tr. Card. Co., and Tr. Sennæ.

Aqua Carui 1 lb. to 1 gallon.

A colourless water, prepared by distilling 1 gallon of water from 1 lb. of caraway fruit, and 2 gallons of water.

Dose—1 to 2 oz.

Oleum Carui

The faint-yellow oil distilled in Britain from Caraway fruit.

Dose—1 to 4 minims, on sugar.

IN—Confectio Scammonii and Pilula Aloes Barb.

CARYOPHYLLUM (Clove)—Myrtaceæ.

The dried unexpanded fragrant flower buds of *Eugenia caryophyllata* (*Caryophyllus aromaticus*) ; with a cylindrical body, spherical head, and four teeth.

Carminative, Stimulating Aromatic, and Tonic.

IN—Infus. Aurant. Co., Mist. Ferri Ar., Vin. Opii, and Pulv. Cretæ Ar.

Infusum Caryophylli $\frac{1}{4}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour.)

Prepared by infusing $\frac{1}{4}$ oz. cloves in 10 oz. boiling water.

Dose—1 to 4 oz.

Oleum Caryophylli

The clear, yellowish oil distilled in Britain from cloves.

Antispasmodic, Stimulant, and powerfully Antiseptic.

Dose—1 to 4 minims, on sugar.

IN—Confect. Scam., Pil. Col. Co., Mist. Ol. Ricini, Pil. Col. et Hyos.

CASCARA SAGRADA (see *Rhamni Purshiani Cortex*).**CASCARILLÆ CORTEX** (Cascarilla Bark) — Euphorbiaceæ.

The dried bark of *Croton Eluteria* in small, dull-brown quills (coated with lichens) covered with a brown separable corky layer, with a warm taste and aromatic odour.

An Aromatic Bitter Tonic.

Infusum Cascarillæ 1 oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

Prepared by infusing 1 oz. cascarilla in 10 oz. boiling water.

Dose—1 to 2 oz.

Tinctura Cascarillæ $2\frac{1}{2}$ oz. to 1 pint.

A dark brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. of powdered cascarilla with 1 pint proof spirit.

Dose— $\frac{1}{2}$ to 2 drs. diluted.

CASSIÆ PULPA (Cassia Pulp)—Leguminosæ.

The soft, sweet, brown pulp obtained from the recently imported pods of Cassia Fistula. Pods are $1\frac{1}{2}$ to 2 feet long.

Laxative. Used as an addition to senna in Confectio Sennæ.

CATECHU (Catechu)—Cinchonaceæ. (Synonym—Catechu Pallidum).

An extract of the leaves and shoots of Uncaria Gambier in variably sized masses, or hard cubes (1 inch square), brown externally, yellow internally.

A Tonic Astringent. Dose—10 to 30 grs., in powder.

Infusum Catechu 160 grs. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

Prepared by infusing 160 grs. catechu and 30 grs. cinnamon in 10 oz. boiling water.

Dose—1 to 2 oz. As the catechu preparations contain so much tannin, they cannot be given with preparations of iron.

Tinctura Catechu $2\frac{1}{2}$ oz. to 1 pint.

A rich coffee-brown liquid, prepared by macerating $2\frac{1}{2}$ oz. of catechu and 1 oz. cinnamon in 1 pint proof spirit.

Dose— $\frac{1}{2}$ to 2 drs. 5 to 10 minims for a child 1 year old.

Pulvis Catechu Compositus 1 in $2\frac{1}{2}$.

A reddish-brown powder, consisting of catechu 4 oz.; kino, and rhatany, of each 2 oz.; cinnamon, and nutmeg, of each 1 oz.

A Tonic Astringent in chronic diarrhœa.

Dose—20 to 40 grs.; for a child 1 year old, 2 to 5 grs.

Trochisci Catechu 1 gr. in each lozenge.

Brownish lozenges, consisting of—catechu, sugar, powdered gum acacia, mucilage of gum acacia, and water.

Local Astringent for relaxed throat. Dose—1 to 6 lozenges.

CERA ALBA (White Wax).

Yellow wax, bleached by exposure to moisture, air, and light; in nearly white, translucent masses or cakes.

IN—Charta Epispastica, Ungt. Cetacei, and Ungt. Simplex.

CERA FLAVA (Yellow Wax)—Hymenoptera.

The prepared honey-comb of the Hive Bee, *Apis mellifica*, in firm, yellow masses; not unctuous to the touch, melts at 146° .

Used chiefly as a basis for ointments and plasters.

It enters into 6 ointments, 6 plasters, and Pil. Phosphori.

CEREVISIÆ FERMENTUM (Beer Yeast, or Barm).

The viscid, semi-fluid, frothy ferment obtained in brewing beer, and produced by *Saccharomyces* (*Torula*) *cerevisiæ*.

A Tonic Stimulant. Dose— $\frac{1}{2}$ to 1 oz., in flavoured water.

omit

Cataplasma Fermenti (Yeast Poultice).

Prepared by mixing 6 oz. yeast with 6 oz. water at 100° and adding 14 oz. wheaten flour, and allowing the mass to "rise."

A Stimulating Deodoriser to foul sores.

CERII OXALAS (Oxalate of Cerium) $Ce_3(C_2O_4)_3, 9H_2O$

A white granular precipitate, obtained by mixing solutions of oxalate of ammonium and any soluble salt of cerium. It usually contains oxalates of lanthanum and didymium.

A Gastric Sedative like bismuth; given in the vomiting of pregnancy. Dose—1 to 2 grs. in a pill, or as a powder.

CETACEUM (Spermaceti).

A concrete fatty substance, in pearly, lustrous masses, obtained from the head of the Sperm whale (*Physeter Macrocephalus*), separated from oil by filtration and pressure.

Internally, Demulcent; externally, Emollient.

IN—Charta Epispastica, and

Unguentum Cetacei 1 in 5½.

A pearly-white ointment, prepared by melting 5 oz. spermaceti, 2 oz. white wax, 1 pint almond oil, and ½ oz. benzoin, straining and stirring till cold.

An Emollient dressing for sores and blisters.

CETRARIA (Iceland Moss or Iceland Lichen)—Lichenes.

The leafy, crisp, brownish-white lichen, *Cetraria islandica*.

Decoctum Cetrariæ 1 oz. to 1 pint.

Prepared by boiling 1 oz. Iceland moss with 20 oz. of water for 10 minutes, and making the strained product to measure 20 oz.

Demulcent and Nutritive Tonic.

Dose—1 to 4 oz. (Or as a basis for cough mixtures.)

CHARTA EPISPASTICA—(See Cantharides).**CHIRATA** (Chiretta)—Gentianaceæ.

The dried plant *Ophelia Chirata* (*Gentiana Chirata*), collected when the fruit begins to form. The unbranched root is 3 inches, and the stems are 3 feet long, about the size of goose quills, with opposite branches and panicked flowers.

A pure bitter Tonic like gentian.

Infusum Chiratæ ¼ oz. to ½ pint (½ hour).

Prepared by infusing ¼ oz. chiretta in 10 oz. water at 120°.

Dose—1 to 2 oz.

Tinctura Chiratæ 2½ oz. to 1 pint.

A tea-coloured liquid, prepared by macerating and percolating 2½ oz. chiretta with 1 pint proof spirit.

Dose—½ to 2 drs.

CHLORAL HYDRAS (Hydrate of Chloral) $\text{C}_2\text{HCl}_3\text{O}, \text{H}_2\text{O}$

(Synonym—Hydrous Chloral). In colourless crystals, prepared by the action of dry chlorine gas on anhydrous alcohol, and the chloral thus produced purified by sulphuric acid and lime, and converted into the hydrate by the addition of water.

Hypnotic and Sedative. Dose—5 to 30 grs.

Syrupus Chloral 10 grs. in 1 dr.

A colourless syrup, prepared by dissolving 80 grs. hydrate of chloral in $1\frac{1}{2}$ drs. water, and adding simple syrup to 1 oz.

Dose— $\frac{1}{2}$ to 2 drs.

CHLORINE (Cl)

Only used in the following forms :—

Liquor Chlorig 2.66 grs. Cl. in 1 oz.

Chlorine gas dissolved in water, forming a yellowish-green liquid, prepared by acting on the black oxide of manganese with hydrochloric acid, and passing the gas through water.

Antiseptic and Deodorant. Externally, for foul ulcers.

Dose—10 to 20 minims, diluted.

Vapor Chlorig (Inhalation of Chlorine).

2 oz. chlorinated lime put into an inhaler and moistened with cold water, so that the vapour may be inhaled.

For other Preparations of Chlorine, see "Soda" and "Calx."

CHLOROFORMUM (Chloroform)— CHCl_3

A limpid, colourless liquid, prepared by distilling diluted alcohol with lime and chlorinated lime, and purifying the crude chloroform by washing with water and sulphuric acid, and by distillation with lime and chloride of calcium. 1 per cent. ethylic alcohol is added at the end of the process.

Sedative, Anæsthetic, Anodyne, either swallowed or inhaled.

Dose—3 to 10 mins. Externally, Rubefacient or Anodyne.

Aqua Chloroformi 1 in 200.

A colourless solution of 1 dr. chloroform in 25 oz. of water.

Dose— $\frac{1}{2}$ to 2 oz. Used chiefly as a vehicle.

Linimentum Chloroformi 1 in 2.

A pale-yellow liquid, prepared by mixing 2 oz. chloroform with 2 oz. camphor liniment.

Rubefacient and Anodyne.

Spiritus Chloroformi (Spirit of Chloroform) 1 in 20.

(Synonyms—Chloric Ether ; Spirit of Chloric Ether).

1 oz. chloroform dissolved in 19 oz. rectified spirit.

Dose—20 to 60 minims, in water.

Tinctura Chloroformi Composita 1 in 10.

A brilliant red liquid, consisting of 2 oz. chloroform, 8 oz. rectified spirit, and 10 oz. compound tincture of cardamoms.

Dose—20 to 60 minims.

Tinctura Chloroformi et Morphinae 1 in 8.

Contains $1\frac{1}{4}$ min. of chloroform and $\frac{1}{48}$ gr. morphine in 10 minims. Introduced as a substitute for Chlorodyne, which it somewhat resembles, it consists of 1 oz. chloroform, 2 drs. ether, 1 oz. spirit, 8 grs. hydrochlorate of morphine, $\frac{1}{2}$ oz. diluted hydrocyanic acid, 4 mins. oil of peppermint, 1 oz. liquid extract of liquorice, 1 oz. treacle, and syrup to 8 oz.

Narcotic and Antispasmodic. Dose—5 to 10 minims.

CHRYSAROBINUM (Chrysarobin)—Leguminosæ.

(Synonyms—Araroba Powder ; Goa Powder). *A yellowish crystalline powder, being the dried and powdered medullary matter of the stem and branches of *Andira araroba*, containing a variable amount of chrysophanic acid.

Antiparasitic in Skin Diseases.

Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr. ($\frac{1}{10}$ gr. sometimes will cause gastritis).

Unguentum Chrysarobini 1 in 25.

A yellowish ointment, prepared by dissolving with heat 20 grs. chrysarobin in 480 grs. benzoated lard.

Antiparasitic and Stimulating application in psoriasis.

CIMICIFUGÆ RHIZOMA (*Cimicifuga*) Ranunculaceæ.

(Synonym — *Actææ Radix*). The dried brownish-black, flattened-cylindrical rhizome, and small, wiry, brittle branched rootlets of *Cimicifuga racemosa* (*Actæa racemosa*).

Cardiac Tonic, Expectorant, and Antirheumatic.

Extractum Cimicifugæ Liquidum 1 in 1.

Prepared by evaporating a strong tincture of 20 oz. cimicifuga and dissolving the extract so formed in rectified spirit q.s. to make 20 oz.

Dose—3 to 30 minims.

Tinctura Cimicifugæ $2\frac{1}{2}$ oz. to 1 pint.

Prepared by macerating and percolating $2\frac{1}{2}$ oz. cimicifuga (in No 40 powder) with proof spirit 1 pint.

Dose—15 to 60 minims.

* ~~NOTE~~ "A concretion. erroneously stated in B.P. to be the medullary matter, the crude substance has, apparently in error, been made official."—MARTINDALE.

MB.
The oil of peppermint is rectified with 40% spirit
2 drs. of liquorice & 8 drs. of syrup
plus proof spirit treacle & ether
make a good vehicle for strong water.


CINCHONÆ CORTEX (Cinchona Bark)—Cinchonaceæ. *omit*

The P.B. now recognises the following barks :—

- (1) *Cinchona succirubra* (red bark); (2) *Cinchona Calisaya* (yellow bark); (3) *Cinchona officinalis* (pale bark); (4) *Cinchona lancifolia*; (5) Other unnamed species of *Cinchona*; (6) Some unnamed species of *Remijia*.

From any of these may be obtained :—

Cinchoninæ and Cinchonidinæ Sulphas, Quininæ Hydrochloras and Quininæ Sulphas.

 In all the Galenical preparations the *red* bark from cultivated plants only is permitted.

CINCHONÆ RUBRÆ CORTEX (Red Cinchona Bark). *h B.*

The dried bark of the stem and branches of *cultivated* plants of *Cinchona succirubra*, in quills or incurved pieces, coated with periderm; bark itself $\frac{1}{10}$ to $\frac{1}{4}$ inch thick, outer surface roughened by fissures, cracks, and warts, and brownish-red, inner surface brick red. It should yield between 5 and 6 per cent. of total alkaloids, of which not less than half should consist of quinine and cinchonidine.

Antiperiodic, Tonic, Antipyretic, and Astringent.

Dose—10 to 60 grs. in powder.

Decoctum Cinchonæ $1\frac{1}{4}$ oz. to 1 pint.

A reddish, muddy liquid, prepared by boiling $1\frac{1}{4}$ oz. red bark in 1 pint distilled water for 10 minutes, straining when cold, and making the strained product to measure 1 pint.

Dose—1 to 2 oz. Mixtures containing it require to be shaken.

Extractum Cinchonæ Liquidum 5 per cent. alkaloids. *Shuddady*


A brownish liquid, prepared by exhausting 20 oz. red cinchona bark with hydrochloric acid, glycerine, and water, and evaporating to 1 pint, determining the alkaloidal strength of this and by evaporating further, or adding water and spirit, making the finished liquid contain 5 grs. of alkaloids in every 100 grs. 1 oz. will nearly represent 1 oz. bark.

Dose—5 to 10 minims.

Infusum Cinchonæ Acidum $\frac{1}{2}$ oz. to 10 oz. (1 hour).

(Synonym—Infusum Cinchonæ). Prepared by infusing for one hour $\frac{1}{2}$ oz. red bark (in No. 40 powder) and 1 dr. aromatic sulphuric acid in $\frac{1}{2}$ pint boiling water.

Dose—1 to 2 oz.

 *Cinchona* is the only B.P. drug with both a decoction and infusion.

Tinctura Cinchonæ 4 oz. to 1 pint.

A reddish-brown liquid, prepared by macerating and percolating 4 oz. red bark (in No. 40 powder) with 1 pint proof spirit.

Dose— $\frac{1}{2}$ to 2 drs.

Tinctura Cinchonæ Composita 2 oz. to 1 pint.

A reddish-yellow liquid, prepared by macerating and percolating 2 oz. red bark (in No. 40 powder), 1 oz. bitter orange peel, $\frac{1}{2}$ oz. serpentary rhizome, 55 grs. saffron, and 28 grs. cochineal in 1 pint proof spirit.

Tonic and Astringent. Dose— $\frac{1}{2}$ to 2 drs.

Red cinchona bark also enters into Mistura Ferri Aromat.

CINCHONIDINÆ SULPHAS (Sulphate of Cinchonidine)
($C_{20}H_{24}N_2O$)₂, H_2SO_4 , $3H_2O$

The sulphate of an alkaloid, in colourless, silky crystals, obtained from the bark of various species of Cinchona, by concentrating the mother-liquors of the crystallisation of sulphate of quinine, and purifying by recrystallisation from alcohol and finally from hot water. Resembles quinine in action.

Dose—I to 10 grs. in water, in which medium it is soluble.

CINCHONINÆ SULPHAS (Sulphate of Cinchonine)
($C_{20}H_{24}N_2O$)₂, H_2SO_4 , $2H_2O$

The sulphate of an alkaloid, in hard, colourless, prismatic crystals, obtained from the bark of various species of Cinchona and Remijia, by adding caustic soda to the mother-liquors of the crystallisation of the sulphates of quinine, cinchonidine, and quinidine, washing the precipitate with spirit, dissolving in sulphuric acid, and purifying with animal charcoal.

Action and Dose—Same as Sulphate of Cinchonidine.

CINNAMOMI CORTEX (Cinnamon Bark)—Lauraceæ.

In light, yellowish-brown, closely-rolled, very thin, splintery quills, being the dried inner bark of the shoots from the truncated stocks or stools of the cultivated *Cinnamomum zeylanicum* from Ceylon, and known as Ceylon Cinnamon.

Carminative and Stomachic. Dose—10 to 20 grs.

Aqua Cinnamomi 20 oz. to 1 gallon.

A colourless water, prepared by distilling 1 gallon from 20 oz. cinnamon and 2 gallons water.

Dose—I to 2 oz.

IN—Mist. Cretæ, Mist. Guaiaci, and Mist. Spt. Vini Gallici.

Oleum Cinnamomi

The oil distilled from Cinnamon bark; yellowish when recent, but gradually becoming cherry-red. *It sinks in water.*

Dose—I to 4 minims, on sugar or in mucilage.

Spiritus Cinnamomi 1 in 50.

1 oz. oil of cinnamon and 49 oz. rectified spirit.

Dose— $\frac{1}{2}$ to 1 drachm.

IN—Acid. Sulphuric, Aromat.

Pulvis Cinnamomi Compositus 1 in 3.

(Synonym—*Pulvis Aromaticus*). A pale brown powder, consisting of cinnamon, cardamoms, and ginger—of each 1 oz.

Dose—3 to 10 grs.

IN—*Pil. Aloes et Ferri* and *Pil. Cambogiæ Co.*

Tinctura Cinnamomi 2½ oz. to a pint.

A reddish-brown liquid, prepared by macerating and percolating 2½ oz. of cinnamon with 1 pint rectified spirit.

Dose—½ to 2 drs.; for a child 1 year old 5 minims, on sugar.

Cinnamon also enters into *Decoct. Hæmatoxyli*, *Infus. Catechu*, and *Vin. pii*; 4 compound powders—*i.e.*, catechu, kino, chalk, and cinnamon; and tinctures—*i.e.*, cardamoms, catechu, cinnamon, and lavender.

COCA (Coca) (Synonym—Cuca). Erythroxylaceæ.

The smooth, dried, green, oval, blunt leaves of *Erythroxylon Coca*, shortly stalked, and with faint tea-like odour.

Tonic and Restorative. Dose—½ to 2 drs.

Extractum Cocæ Liquidum 1 in 1.

A brown liquid, prepared by exhausting 20 oz. coca with proof spirit, and evaporating the resulting tincture to 20 oz.

Dose—½ to 2 drs.

Cocainæ Hydrochloras (Hydrochlorate of Cocaine).

The hydrochlorate of an alkaloid in colourless acicular crystals, obtained from coca leaves by (1) rendering alkaline with carbonate of sodium an aqueous solution of an acidulated alcoholic extract; (2) adding ether to this, separating and evaporating the liquid; (3) purifying the product by acidulated water, carbonate of sodium, and ether; (4) decolorising; (5) neutralising with hydrochloric acid and re-crystallising.

Local Anæsthetic. Dose—⅓ to 1 gr.

Amellæ Cocainæ (Discs of Cocaine).

Discs of gelatine, with some glycerine, each weighing about 5 gr. and containing ⅓ gr. hydrochlorate of cocaine.

Liquor Cocainæ Hydrochloratis 1 in 10.

Hydrochlorate of cocaine 33 grs., salicylic acid ½ gr., dissolved in 6 drs. boiling distilled water.

Dose—2 to 10 mins. Used also locally.

COCCUS (Cochineal)—Hemiptera.

The greyish-white, wrinkled, oval, dried female insect *Coccus acti*, reared on *Opuntia cochinillifera* and other *Opuntia*. Used as a rich, red, harmless, colouring agent.

IN—*Tr. Card. Co.*, *Tr. Cinch. Co.*, and

Tinctura Cocci 2½ oz. to 1 pint.

A carmine-coloured liquid, prepared by *macerating* 2½ oz. cochineal in 1 pint proof spirit. Used for colouring mixtures.

CODEINA (Codeine) $C_{18}H_{21}NO_3, H_2O$

(Synonym—Codeia). An alkaloid in colourless octahedral crystals, obtained from opium by evaporating the ammoniacal liquors from which morphine has been obtained, treating the residue with water, precipitating with caustic potash, and purifying by re-crystallising from ether.

Hypnotic—given in Diabetes. Dose—¼ to 2 grs.

COLCHICI CORMUS (Colchicum Corm)—Melanthaceæ.

The *fresh* bulb (about the size of a chestnut) of Colchicum autumnale—meadow saffron, and the same in thin, white, *dried*, kidney-shaped slices. Collected about the end of June.

Diuretic and Purgative—used in Gout. Dose—2 to 8 grs.

Extractum Colchici

A soft, brownish-black extract, prepared by heating the juice of the *fresh* corm to 212°, straining, and evaporating under 160°.

Dose—½ to 2 grs., in pill.

Extractum Colchici Aceticum

A very soft, brownish-black extract, prepared by adding 5 per cent. acetic acid to the *fresh* corms, pressing out the juice, heat it to 212°, straining, and evaporating under 160°.

Dose—½ to 2 grs., in pill.

Vinum Colchici 4 oz. to 1 pint (11 grs. in 1 drachm).

A slightly muddy, tea-coloured liquid, prepared by macerating 4 oz. *dried* colchicum corm in 1 pint sherry.

Dose—10 to 30 minims.

COLCHICI SEMINA (Colchicum Seeds)—Melanthaceæ.

The small, hard, globular, reddish-brown dried ripe seeds of Colchicum autumnale, collected about the end of July.

Action like the corm.

Tinctura Colchici Seminum 2½ oz. to 1 pint.

A brown, sherry-coloured liquid, prepared by macerating and percolating 2½ oz. colchicum seeds with 1 pint proof spirit.

Dose—10 to 30 minims.

COLLODIUM (Collodion) 1 in 48.

A colourless syrupy liquid, consisting of a solution of 1 oz. pyroxylin (gun-cotton) in 36 oz. ether and 12 oz. spirit.

Protective to wounds.

From the seeds a tincture alone is prepared.

Collodium Flexile (Flexible Collodion).

A colourless, syrupy liquid, prepared by dissolving $\frac{1}{2}$ oz. Canada balsam and $\frac{1}{4}$ oz. castor oil in 12 oz. collodion.

Acts like collodion, but less liable to crack on drying.

Collodium Vesicans (Blistering Collodion).

A thick liquid, consisting of 1 oz. pyroxylin and 20 oz. Blistering liquid.

Acts like cantharides plaster.

COLOCYNTHIDIS PULPA (Colocynth Pulp)—Cucurbitaceæ.

The dried, spongy, light pulp of *Citrullus Colocynthis*—the bitter apple—in broken white balls, the hard yellow rind and the seeds (resembling apple pips) being rejected.

A Drastic Cathartic. Dose—2 to 8 grs., in pill.

Extractum Colocynthidis Compositum 1 in $4\frac{1}{2}$ nearly.

A firm, blackish mass, prepared by exhausting 6 oz. colocynth pulp with 1 gallon of proof spirit, and, after the volatile spirit is distilled from the resulting tincture, 12 oz. extract of Socotrine aloes, 4 oz. resin of scammony, 3 oz. curd soap, and 1 oz. cardamoms, all in fine powder, are added, and the evaporation continued till a pilular consistence is reached.

Purgative, like Pil. Col. Co. Dose—3 to 10 grs.

Pilula Colocynthidis Composita 1 in 6.

Prepared by beating together 1 oz. colocynth pulp, 2 oz. Barbadoes aloes, 2 oz. scammony resin, $\frac{1}{4}$ oz. sulphate of potassium, and 2 drs. oil of cloves, with q.s. distilled water. Distinguished from the extract by the odour of cloves.

Dose—5 to 10 grs.

Pilula Colocynthidis et Hyoscyami 1 and 3 in 9.

1 oz. extract of henbane and 2 oz. colocynth pill.

Dose—5 to 10 grs. Not so liable to gripe as Pil. Col. Co.

CONII FOLIA (Hemlock Leaves)—Umbelliferæ.

The finely-divided, smooth, *fresh* leaves and young branches of the Spotted Hemlock, *Conium maculatum*. Gathered from wild British plants when the fruit begins to form. The stems are smooth and marked with purple spots.

Anodyne, Narcotic, Sedative. Dose—2 to 8 grs.

Cataplasma Conii 1 to 14.

1 oz. hemlock juice, evaporated to half its bulk, and mixed with 4 oz. linseed meal, and 10 oz. boiling water.

Anodyne.

*col. pulp make pil. col. co.
with sulphate of potash & Barbadoes
with Socotrine, scammony, resin of cloves.
evaporated till a pilular consistence is reached*

Extractum Conii

The green extract prepared by the evaporation of fresh hemlock juice from the leaves and branches, by the same process as described under Extract of Aconite.

Dose—2 to 6 grs. in pill. If combined with an alkali or surrounded by chalk powder, pills with hemlock give out the stinking odour of mice.

Pilula Conii Composita $2\frac{1}{2}$ in 3.

$2\frac{1}{2}$ oz. extract of hemlock, $\frac{1}{2}$ oz. ipecacuanha, treacle q.s.

Dose—5 to 10 grs., as above.

Succus Conii

A brownish liquid, consisting of the juice of hemlock leaves to which $\frac{1}{3}$ of rectified spirit is added.

Dose— $\frac{1}{2}$ to 1 dr.

Unguentum Conii 2 of juice in 1.

A yellow ointment, prepared by evaporating 2 oz. hemlock juice under 140° F. to 2 drs., adding 10 grs. boric acid and 6 drs. lanoline.

Local Anodyne in painful conditions of the rectum and anus.

This is the ointment first introduced by the writer, and now sanctioned by the B.P. The boric acid is added to make the preparation keep, but it is not necessary.

Vapor Coninæ (Inhalation of Conine).

Juice of hemlock $\frac{1}{2}$ oz., liquor potassæ 1 dr., and distilled water 1 oz., mixed. 20 minims poured on a sponge, in a suitable apparatus, and the vapour of hot water passed over it.

CONII FRUCTUS (Hemlock Fruit)—Umbelliferæ.

The dried, small, seed-like, greyish fruit, consisting of separate mericarps, with five waved ridges, of *Conium Maculatum*, gathered when fully developed but while still green.

Action like the leaves.

Tinctura Conii $2\frac{1}{2}$ oz. to 1 pint.

A brownish liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. of the finely comminuted fruit with 1 pint of proof spirit.

Dose—20 to 60 minims.

COPAIBA (Copaiva or Copaiba) from Leguminosæ.

The thick, yellow, fluid oleo-resin, obtained from deep incisions in the trunk of *Copaifera Langsdorffii* or other *Copaifera*.

Stimulant to urinary and other mucous surfaces.

Dose— $\frac{1}{2}$ to 1 dr., in emulsion, capsules, or confection.

Conium leaves can easily produce sleep needles

Oleum Copaibæ

The colourless or pale-yellow oil distilled from Copaiva.

Dose—5 to 20 minims, as above.

CORIANDRI FRUCTUS (Coriander Fruit)—Umbelliferæ.

The small, globular, ribbed, yellowish-brown, dried, ripe, seed-like fruit of *Coriandrum sativum*.

Antispasmodic and Carminative. Dose—10 to 60 grs.

IN—Confect. Sennæ, Syr. Rhei, Tinct. Rhei, and Tinct. Sennæ.

Oleum Coriandri

The yellowish oil distilled in Britain from the fruit.

Dose—I to 4 minims, on sugar or in emulsion.

IN—Syrupus Sennæ.

CREASOTUM (Creasote).

A colourless or pale-yellow oily liquid, a product of the distillation of Wood Tar.

Sedative, Astringent, and Antiseptic. Externally Styptic.

Dose—I to 3 minims, in pill, or in capsules.

Mistura Creasoti 1 minim in 1 oz. (nearly).

A nearly colourless mixture, consisting of creasote and glacial acetic acid 15 minims each, spirit of juniper $\frac{1}{2}$ drachm, syrup 1 oz., and distilled water 15 oz.

Dose—I to 2 oz.

Unguentum Creasoti 1 in 9.

A yellowish-white or cream-coloured ointment, prepared by mixing 1 dr. creasote and 1 oz. simple ointment.

Vapor Creasoti 12 minims to 8 oz.

12 minims of creasote mixed in a suitable apparatus with 8 oz. boiling water, so that air can be passed through the mixture and afterwards inhaled.

CRETA (Chalk) CaCO_3

Native friable carbonate of calcium. Used for making CO_2 .

CRETA PRÆPARATA (Prepared Chalk) CaCO_3

In little conical masses, or as an almost amorphous white powder, freed from its impurities by elutriation.

Antacid and Astringent. Dose—10 to 60 grs.

IN—Hydrarg. cum Creta 2 in 3, and in

Mistura Cretæ $\frac{1}{4}$ oz. to 8 oz.

A white, milky mixture, prepared by rubbing up $\frac{1}{4}$ oz. prepared chalk, $\frac{1}{4}$ oz. powdered gum acacia, $\frac{1}{2}$ oz. syrup, in $7\frac{1}{2}$ oz. cinnamon water.

Dose—I to 2 oz. For a child 1 year old 1 to 2 drs.

Pulvis Cretæ Aromaticus 1 in 4 (nearly). (Synonym—*Confectio Aromatica*). A pale brown powder, consisting of cinnamon, nutmeg, saffron, cloves, cardamoms, sugar, and chalk, 4. 3. 3. 1½. 1. 25. 11.

Astringent. Dose—10 to 60 grs.

Pulvis Cretæ Aromaticus cum Opio 1 in 40 of opium.

A pale brown powder, prepared by mixing 9¾ oz. of aromatic powder of chalk with ¼ oz. powdered opium.

Aromatic, Astringent, and Narcotic.

Dose—10 to 40 grs. ; for a child 1 year old, 1 gr.

CROCUS (Saffron)—Iridaceæ.

The tops of the dried thread-like styles of *Crocus sativus*, each terminating in three stigmas, and measuring about 1 inch.

Supposed Emmenagogue ; only used for its colour.

IN—Decoct. Aloes Co., Pil. Aloes et Myrrhæ, Pulv. Cretæ Aromat., Tinct. Cinch. Co., Tinct. Opii Ammon., and Tinct. Rhei.

Tinctura Croci 1 oz. to 1 pint.

A bright yellowish-brown liquid, prepared by macerating and percolating 1 oz. saffron with 1 pint proof spirit.

Dose—½ to 2 drs.

CROTONIS OLEUM (Croton Oil)—from Euphorbiaceæ.

The viscid, fluorescent, brownish-yellow oil, *expressed* in Britain from the seeds of *Croton Tiglium*.

Hydragogue Cathartic, acts generally within one or two hours.

Dose—⅓ to 1 minim, in pill or on dry sugar.

Linimentum Crotonis 1 in 8.

A green liquid, consisting of croton oil 1 oz., oil of cajuput and rectified spirit, of each 3½ oz.

Rubefacient and Counter-irritant.

CUBEBA (Cubebs)—Piperaceæ.

The globular, dried, unripe fruit of *Piper Cubeba* (*Cubeb officinalis*), about the size and colour of black pepper, with stalk attached to it ; hence called tailed pepper.

Diuretic and Expectorant.

Dose in gonorrhœa—¼ to 2 drs.

Oleo-Resina Cubebæ (Oleo-Resin of Cubebs).

The liquid obtained after exhausting cubebs with ether, and allowing the ether to evaporate, and the crystalline matter deposit.

Dose—5 to 30 minims, in emulsion with mucilage or egg.

Oleum Cubebæ

A pale greenish-yellow oil, distilled from cubebs in Britain.

Dose—5 to 20 minims, in emulsion with mucilage.

Tinctura Cubebæ $2\frac{1}{2}$ oz. to 1 pint.

A clear sherry-coloured liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. cubebs with 1 pint *rectified* spirit.

Dose— $\frac{1}{2}$ to 2 drs.

CUPRUM (Copper) **Cu**

Fine Copper Wire, about No. 25 gauge (0.02 of an inch).

Used in preparing Spt. *Æther. Nitrosi*.

Cupri Nitras $\text{Cu}(\text{NO}_3)_2, 3\text{H}_2\text{O}$ (Synonym—Cupric Nitrate).

Deep blue, prismatic, deliquescent crystals, obtained by dissolving copper in nitric acid and evaporating until crystals form, on cooling to a temperature not lower than 70° .

Astringent and Caustic.

Cupri Sulphas $\text{CuSO}_4, 5\text{H}_2\text{O}$

A blue crystalline salt in oblique prisms, obtained by dissolving copper or its black oxide in sulphuric acid, and purifying by recrystallisation from hot water.

Astringent, Tonic, Emetic, and Caustic.

Dose—As an Astringent, $\frac{1}{4}$ gr. to 2 grs., in pill; as an Emetic, to 10 grs., in solution in water.

CUSPARIÆ CORTEX (Cusparia Bark)—Rutaceæ.

The straight incurved pieces or quills, bevelled at the edges, with an external corky layer and mottled brown epidermis of *Malpighia Cusparia*. Known also as *Angostura Bark*.

Bitter Tonic. Dose—10 to 30 grs. in powder.

Infusum Cuspariæ $\frac{1}{2}$ oz. to $\frac{1}{2}$ pint (1 hour).

$\frac{1}{2}$ oz. Cusparia bark infused in 10 oz. distilled water at 120° .

Dose—1 to 2 oz.

KUSSO (Kousso)—Rosaceæ.

The dried panicles chiefly of the female flowers of *Hagenia abyssinica* (*Brayera anthelmintica*) in compressed clusters or cylindrical rolls; the small female flowers are reddish-brown on hairy stalks, with calyx five-parted.

Anthelmintic for *tænia solium*. Dose— $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Infusum Cusso $\frac{1}{2}$ oz. to 8 oz. ($\frac{1}{4}$ hour).

Kousso $\frac{1}{2}$ oz., infused in 8 oz. boiling distilled water.

Dose—4 to 8 oz., without straining.

DIGITALIS FOLIA (Foxglove Leaves)—Scrophulariaceæ.

The large, wrinkled, downy, dried leaves, with bluntly serrated edges, of *Digitalis purpurea* (Purple Foxglove). From wild British plants of the second year's growth, when about two-thirds of the flowers are expanded.

Diuretic and Cardiac Tonic. Dose— $\frac{1}{2}$ to $1\frac{1}{2}$ grs. in pill.

Infusum Digitalis 28 grs. to 10 oz. ($\frac{1}{4}$ hour).

28 grs. digitalis leaf infused in 10 oz. boiling distilled water.

Dose—2 to 4 drs.

Tinctura Digitalis $2\frac{1}{2}$ oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. digitalis leaf with 1 pint proof spirit.

Dose—10 to 30 mins. 2 to 4 drs. in Delirium Tremens.

ECBALLII FRUCTUS (Squirting Cucumber Fruit)—

Cucurbitaceæ. (Synonym—*Elaterii Fructus*).

The nearly ripe fruit (resembling a small hairy cucumber) of *Ecballium Elaterium* from plants cultivated in Britain.

ELATERIUM (Elaterium) (Synonym—*Extractum Elaterii*).

A sediment in thin, friable, greenish-grey, curved cakes obtained by collecting the deposit which settles down from the juice of the Squirting Cucumber fruit.

Hydragogue Cathartic. Dose— $\frac{1}{16}$ to $\frac{1}{2}$ gr.

ELATERINUM (Elaterin) $C_{20}H_{28}O_5$

A chemically neutral substance, being the active principle of elaterium, in small, colourless crystals, obtained by exhausting elaterium with chloroform, adding ether to the solution, washing and recrystallising the precipitate from chloroform.

A Drastic Hydragogue Cathartic. Dose— $\frac{1}{40}$ to $\frac{1}{10}$ gr.

Pulvis Elaterini Compositus 1 in 40.

A white powder, consisting of elaterin 5 grs., rubbed up with sugar of milk 195 grs.

Dose— $\frac{1}{2}$ to 5 grs., in pill or powder.

ELEMI (Manila Elemi)—Amyridaceæ, or Burseraceæ.

A concrete resinous exudation in yellowish-white adhesive masses, probably from *Canarium commune*.

A Stimulating Rubefacient, and used only externally.

Unguentum Elemi 1 in 5. (Known as Balm of Arcæus).

A dirty, yellowish-white ointment, prepared by melting together $\frac{1}{4}$ oz. elemi and 1 oz. simple ointment, and straining.

Emplastrum Calefaciens—(See under *Cantharis*).

ERGOTA (Ergot)—Fungi and Graminaceæ.

Ergot is the spawn or sclerotium of *Claviceps purpurea*, produced between the pales and replacing the grain of *Secale cereale*; in long, dark-purple, cylindrical, brittle grains, pinkish-white internally.

Emmenagogue. Acting on unstripped muscular fibre.

Dose—20 to 30 grs. Seldom, however, given in powder.

Extractum Ergotæ Liquidum 1 oz. in 1 oz.

A deep, coffee-brown liquid, obtained by exhausting 16 oz. of ergot with 6 pints of water, evaporating this to 10 oz., and adding 6 oz. rectified spirit.

Dose—10 to 30 minims, in water.

Ergotinum (Ergotin, Ergotine, or Bonjean's Ergotine).

Purified extract of ergot, prepared by evaporating upon a water-bath the liquid extract of ergot to a syrupy state, adding spirit, filtering, and continuing the evaporation till the consistence of a soft extract is reached.

Dose—2 to 5 grs., in pill.

Injectio Ergotini Hypodermica 1 in 3.

100 grs. ergotin dissolved in 200 fluid grs. of camphor water.

Dose—By subcutaneous injection, 3 to 10 mins.

Infusum Ergotæ $\frac{1}{4}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

$\frac{1}{4}$ oz. crushed ergot infused in 10 oz. boiling distilled water.

Dose—I to 2 oz.

Tinctura Ergotæ 5 oz. to 1 pint.

A coffee-brown liquid, prepared by macerating and percolating 5 oz. finely comminuted ergot with 1 pint proof spirit.

Dose—5 to 30 minims.

ETHER—(See under *Æther*.)**EUCALYPTI GUMMI** (Eucalyptus Gum)—Myrtaceæ.

The ruby exudation or so-called red gum from the bark of *Eucalyptus rostrata* and other species; from Australia.

Astringent like catechu. Dose—2 to 10 grs.

EUCALYPTI OLEUM (Oil of Eucalyptus)—Myrtaceæ.

The colourless or pale yellow oil distilled from the fresh leaves of *Eucalyptus Globulus*, *E. amygdalina*, and probably other species.

A powerful Antiseptic. Dose—I to 4 minims.

Unguentum Eucalypti 1 in 5.

A yellowish ointment, prepared by melting soft and hard paraffin, of each 2 oz., and adding eucalyptus oil 1 oz. by weight.

EUONYMI CORTEX (Euonymus Bark)—Celastraceæ.

The dried root-bark of *Euonymus atropurpureus* (Wahoo), in quilled or curved pieces ($\frac{1}{12}$ – $\frac{1}{8}$ inch), outer surface ash grey, and inner surface whitish.

Extractum Euonymi Siccum (Dry Extract of Euonymus).

A brownish powder, prepared by evaporating a tincture of the dried bark and adding 20 per cent. of sugar of milk. Known as Euonymin.

Cholagogue and Cathartic. Dose—I to 4 grs.

☞ This is the only representative in the B.P. of the American Abstracts.

FARINA LINI—(See Lini Farina).**FARINA TRITICI** (Wheaten Flour)—Graminaceæ.

The grain of wheat, *Triticum sativum* (*Triticum vulgare*) ground and sifted; used in making Cataplasma Fermenti.

FEL BOVINUM PURIFICATUM (Purified Ox Bile).

A dark-green, soft solid, prepared by evaporating fresh ox bile to $\frac{1}{4}$ its volume, adding twice its bulk of spirit, filtering, and continuing the evaporation.

Tonic, Aperient, and Antiseptic. Dose—5 to 10 grs., in pill.

FERRUM (Iron)—Fe

Annealed iron wire (No 35 gauge, about 0.005 inch in diameter) or wrought nails, free from oxide. The different preparations of this substance vary in their actions. Pure iron, for example, acts simply as a Tonic and Hæmatic, or blood improver, whilst the acid preparations are generally powerful Astringents as well. Iron forms a dark ink when ordered with any of the bitter infusions, except those of Quassia and Calumba. The same remark applies to all astringent vegetable tinctures. Iron, like arsenic, should be prescribed to be taken after meals.

Liquor Ferri Acetatis Fortior (40 per cent.)

A deep-red fluid, prepared by dissolving ferric hydrate (formed by precipitating solution of persulphate of iron with ammonia) in glacial acetic acid and water.

Astringent, Tonic, and Diuretic. Dose—I to 8 minims.

Liquor Ferri Acetatis I in 4. (Synonyms—Solution of Ferric Acetate; Solution of Peracetate of Iron.) A red fluid, consisting of strong solution of acetate of iron, 5 oz., distilled water up to 20 oz.

Dose—5 to 30 minims.

Tinctura Ferri Acetatis 5 oz. in 1 pint. (1 in 4)

A brown liquid, prepared by mixing 5 oz. strong solution of acetate of iron, 1 oz. acetic acid, 5 oz. rectified spirit, and 9 oz. distilled water.

Dose—5 to 30 minims, in water.

Ferri Arsenias (Arseniate of Iron).

Arseniates of iron with some oxide. A green, amorphous powder, prepared by mixing a solution of arseniate and bicarbonate of sodium with one of sulphate of iron, and drying the precipitate at a low temperature.

Resembles arsenic in its action. Dose— $\frac{1}{16}$ to $\frac{1}{2}$ gr., in pill.

Ferri Carbonas Saccharata 37 per cent. $\text{FeCO}_3 \times \text{H}_2\text{O}$

Saccharated Carbonate of Iron, consisting of carbonate and peroxide of iron, mixed with sugar. A greyish-brown powder, cohering in little lumps, prepared by mixing solutions of carbonate of ammonium and sulphate of iron, washing the resulting carbonate, rubbing it up with sugar, and drying.

Dose—5 to 30 grs.

Pilula Ferri Carbonatis 1 in $1\frac{1}{4}$.

1 oz. of saccharated carbonate of iron and $\frac{1}{4}$ oz. confection of roses, beaten well together.

Dose—5 to 20 grs.

Mistura Ferri Composita $2\frac{1}{2}$ grs. sulphate to 1 oz.

A muddy, green, changeable mixture, prepared by mixing myrrh and sugar, of each 60 grs., carbonate of potassium 30 grs., spirit of nutmeg $\frac{1}{2}$ oz., rose water $9\frac{1}{2}$ oz., and adding sulphate of iron 25 grs. Commonly called Griffith's Mixture; it contains about 1 gr. carbonate of iron in each ounce.

Hæmatic and Emmenagogue. Dose—1 to 2 oz.

Mistura Ferri Aromatica About 1 gr. of iron in 1 pint.

Commonly called *Heberden's Ink*, and contains *tannate* of iron as an inky precipitate. Prepared by macerating 1 oz. red cinchona bark, $\frac{1}{2}$ oz. calumba, $\frac{1}{4}$ oz. cloves, $\frac{1}{2}$ oz. iron wire, 3 oz. compound tincture of cardamoms, $\frac{1}{2}$ oz. tincture of orange peel. and peppermint water to 16 oz.

Dose—1 to 2 oz.

Ferri et Ammonii Citras

Citrate of Iron and Ammonium, in transparent ruby scales. Prepared by mixing solutions of persulphate of iron and ammonia, and dissolving the freshly precipitated ferric hydrate thus formed in solution of citric acid, and, after the addition of ammonia, evaporating.

Dose—5 to 10 grs. ; a most agreeable tonic in solution.

Vinum Ferri Citratis 8 grs. in 1 oz.

A brownish liquid, prepared by dissolving 160 grs. citrate of iron and ammonium in 1 pint orange wine.

Dose—1 to 4 drs.

Ferri et Quininæ Citras 1 gr. Quinine in 6.

In greenish-yellow scales, being a citrate of Quinine, Iron, and Ammonium. Prepared by dissolving the peroxide of iron (formed as in the last preparation) in citric acid, adding quinine (prepared by precipitating the sulphate by ammonia), neutralising with ammonia, and evaporating.

Hæmatic, Tonic, Antiperiodic. Dose—5 to 10 grs.

Pilula Ferri Iodidi 1 in $3\frac{1}{2}$.

Prepared by mixing 40 grs. iron wire, 80 grs. iodine, 50 minims distilled water, and adding 70 grs. sugar and 140 grs. liquorice, and beating all together.

Dose—3 to 8 grs. Should be dispensed in a bottle.

Syrupus Ferri Iodidi 4·3 grs. FeI_2 in 1 drachm.

A colourless syrup, prepared by heating 1 oz. iron and 2 oz. iodine with 3 oz. distilled water, and adding the filtered product to 28 oz. sugar dissolved in 10 oz. water.

Dose— $\frac{1}{2}$ to 1 dr. Dose for a child 1 year old, 2 mins.

Ferri Peroxidum Hydratum (Peroxide of Iron) $\text{Fe}_2\text{O}_3\cdot\text{H}_2\text{O}$

(Synonyms—Ferric Oxyhydrate; Ferri Sesquioxidum; Ferri Oxidum Rubrum; Hydrrous Peroxide of Iron). A reddish-brown powder, prepared by mixing solutions of soda and persulphate of iron, washing and drying the precipitate at a temperature under 212° .

Dose—5 to 30 grs., in powder.

Emplastrum Ferri (Chalybeate Plaster) 1 in 11.

A red plaster, consisting of peroxide of iron 1 oz. Burgundy pitch 2 oz., lead plaster 8 oz. (Known as Emp. Robrans).

Liquor Ferri Dialysatus (5 per cent.)

Solution of Dialysed Iron—a clear, dark-reddish brown solution of highly basic ferric oxychloride, with the acid mostly removed by dialysis, prepared by adding recently formed ferric hydrate (obtained by mixing strong solutions of perchloride of iron and ammonia) to strong solution of perchloride of iron, dissolving and placing in a dialyser.

Dose—10 to 30 minims.

Liquor Ferri Perchloridi Fortior 2 oz. in 10.

A deep orange-brown liquid, prepared by boiling iron wire in hydrochloric acid and distilled water, and, after filtering, adding nitric acid and more hydrochloric, and concentrating by evaporation.

A powerful Astringent, Caustic, and Hæmostatic.

Liquor Ferri Perchloridi 1 in 4. (Synonym—Solution of Ferric Chloride). A brown liquid, prepared by mixing 5 oz. strong solution of perchloride of iron with 15 oz. distilled water. Dose—10 to 30 minims, freely diluted.

Tinctura Ferri Perchloridi 1 in 4. (Synonym—Tinctura Ferri Sesquichloridi).

A brown liquid, prepared by adding 5 oz. strong solution of perchloride of iron to 5 oz. rectified spirit and 10 oz. distilled water. Dose—10 to 30 minims, freely diluted.

Syrupus Ferri Subchloridi 1 in 30.

Prepared by heating 300 grs. iron wire with 2 oz. hydrochloric acid and 1 oz. distilled water, adding 10 grs. citric acid and syrup to 20 oz. Dose— $\frac{1}{2}$ to 1 dr.

Liquor Ferri Pernitratis 1 oz. iron in 30.

A reddish-brown liquid, prepared by dissolving 1 oz. iron wire in $4\frac{1}{2}$ oz. nitric acid and $25\frac{1}{2}$ oz. distilled water.

Dose—10 to 40 minims, freely diluted.

Ferri Phosphas 47 per cent. ferrous phosphate ($\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$) with ferric phosphate and some oxide.

A slate-blue amorphous powder, prepared by mixing a solution of sulphate of iron with one of phosphate and bicarbonate of sodium, and drying the washed precipitate.

Dose—5 to 10 grs., in powder.

Syrupus Ferri Phosphatis 1 gr. $\text{Fe}_3(\text{PO}_4)_2$ in 1 dr.

A colourless syrup, prepared by dissolving fresh phosphate of iron, made from granulated sulphate of iron, as in last preparation, in concentrated phosphoric acid, sugar, and distilled water.

Dose—1 dr. diluted; in anæmic dyspepsia.

Ferri Sulphas $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$

Pale, greenish-blue crystals, prepared by boiling iron wire in diluted sulphuric acid, and allowing the salt to crystallise.

Tonic, Astringent, and Emmenagogue. Dose—1 to 5 grs.

IN—Pil. Aloes et Ferri, 1 in 7, and in the following.

Ferri Sulphas Exsiccata $\text{FeSO}_4 \cdot \text{H}_2\text{O}$

A greyish powder, prepared by heating the last preparation at 112° , and powdering the residue. $2\frac{1}{2}$ grs. = 4 grs. Ferri Sulphas.

Dose $\frac{1}{2}$ to 3 grs., in pill.

Ferri Sulphas Granulata $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$

In small granular crystals, of a pale-greenish blue, prepared by heating iron wire in diluted sulphuric acid, and filtering the solution into rectified spirit, and stirring constantly.

Dose—1 to 5 grs., in solution or in pill.

Pilula Ferri (Blaud's Pill) 1 gr. *carbonate* in each.

Prepared by mixing 60 grs. of sulphate of iron, 12 grs. sugar, and 4 grs. tragacanth, and adding 36 grs. carbonate of potassium, previously rubbed up with $2\frac{1}{2}$ mins. glycerine, beating into a mass with q.s. water, and dividing into 5-grain pills.

Tonic and Emmenagogue. Dose—1 to 4 pills.

Liquor Ferri Persulphatis $\text{Fe}_2\text{3SO}_4$ 36½ per cent.

(Synonym—Solution of Ferric Sulphate). A dense dark-red liquid, prepared by dissolving 8 oz. sulphate of iron in 6 drs. sulphuric acid and 10 oz. distilled water, and adding 6 drs. nitric acid in 2 oz. distilled water, and making up to 11 oz. after converting all the sulphate into persulphate by boiling.

Styptic; used in making 5 preparations of iron.

Vinum Ferri 1 oz. to 1 pint.

A brown liquid, prepared by *partially immersing* 1 oz. iron wire in one pint of sherry for a month, with frequent agitation.

Dose—1 to 4 drs.; contains a small amount of iron, chiefly as tartrates, malates, and citrates.

Ferrum Redactum (Reduced Iron) Fe and Fe_3O_4

A black powder, consisting of metallic iron and a variable amount of oxide, prepared by passing dry Hydrogen over red-hot hydrated peroxide of iron in an iron tube.

Tonic and Hæmatinic; sometimes called Quevenne's iron.

Dose—1 to 5 grs., in pill.

Trochisci Ferri Redacti 1 gr. in each.

Greyish-black lozenges, consisting of reduced iron 720 grs.; sugar 25 oz., gum acacia 1 oz., mucilage of gum acacia 2 oz., distilled water q.s., divided into 720 lozenges.

Dose—1 to 6 lozenges.

Ferrum Tartaratum (Tartarated Iron) $\text{KFeOC}_4\text{H}_4\text{O}_6$

(Synonyms—Ferri Potassio-tartras; Ferrum Tartarizatum).

In deep garnet scales, prepared by dissolving freshly-precipitated peroxide of iron (deposited from the persulphate solution by ammonia) in solution of cream of tartar, and evaporating carefully.

Dose—5 to 10 grs., in solution in water.

~~RS~~ The double salts of iron with potassium, quinine, and ammonium, are known as the *scale* preparations of iron from their physical characteristics.

FICUS (Fig)—Urticacæ, or Moracæ.

The dried fruit of the common Fig tree—Ficus Carica.

Laxative; used in making Confectio Sennæ.

FILIX MAS (Male Fern)—Filices.

The tufted, scaly, greenish-brown rhizome, with persistent bases of the foot-stalks, and root-fibres of *Aspidium Filix-mas*. Collected late in the Autumn, and divested of scales, roots, and dead matter, and carefully dried. Should not be used if more than 1 year old.

Extractum Filicis Liquidum

A thick, dark-green, oily liquid, prepared by extracting the oleo-resinous matter from the male fern by percolating it with ether, and evaporating the ethereal tincture.

Anthelmintic—for *tania solium*. Dose—15 to 30 minims, in emulsion.

☞ This, the B.P. dose, is too small, 1 dr. should be given.

FŒNICULI FRUCTUS (Fennel Fruit)—Umbelliferæ.

The dried, pale-brown, oblong, ribbed, seed-like, beaked fruit of cultivated plants of *Foeniculum capillaceum* (F. vulgare).

Carminative, Antispasmodic, and Galactagogue.

IN—Pulvis Glycyrrhizæ Compositus.

Aqua Fœniculi 1 lb. to 1 gallon.

A colourless water, obtained by distilling one gallon, from 2 gallons of water, and 1 pound fennel fruit.

Dose—1 to 3 oz. For a child one year old—1 dr.

GALBANUM (Galbanum)—Umbelliferæ.

A fetid, greenish-yellow gum resin, in small tears agglutinated into masses, derived from *Ferula galbaniflua* and *F. rubricaulis*, and probably other species.

Antispasmodic and Expectorant. Dose—2 to 5 grs.

Emplastrum Galbani 1 in 11.

A yellow solid, consisting of galbanum, ammoniacum, and yellow wax, of each 1 oz., and lead plaster 8 oz.

Galbanum enters into Pil. Asafœtidæ Co.

GALLA (Galls)—From Cupuliferæ.

A partially insect and partially vegetable production, growing as a round, tuberculated tumour or excrescence on the oak, *Quercus infectoria* (*Q. lusitanica*, var. *infectoria*), and caused by the irritation from the punctures of *Cynips Gallæ tinctoriæ*, which deposits its ova in the young buds.

Astringent. Generally given in the form of tannin.

Tinctura Gallæ 2½ oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating 2½ oz. galls (in No. 40 powder) with 1 pint proof spirit.

Dose—½ to 2 drs.

Unguentum Gallæ 80 grs. to 1 oz.

A pale-brown ointment, prepared by rubbing 80 grs. powdered galls with 1 oz. benzoated lard.

Astringent. Chiefly used for hæmorrhoids.

Unguentum Gallæ cum Opio 32 grs. to 1 oz.

A light-brown ointment, prepared by mixing 32 grs. powdered opium with 1 oz. ointment of galls.

A Local Anodyne and Astringent to painful hæmorrhoids.

Gallic and Tannic Acids (See under Acidum).**GELATINUM** (Gelatine).

In translucent sheets or shreds, being the air-dried product of the action of boiling water on gelatigenous animal tissues such as skin, tendons, ligaments, and bones; used for making suppositoria glycerini.

GELSEMIUM (Yellow Jasmine)—Loganiaceæ.


The dried yellowish-brown cylindrical rhizome marked with longitudinal purple lines and small attached rootlets of *Gelsemium nitidum* (*G. sempervirens*).

Sedative in Neuralgia of 5th nerve. Dose—5 to 30 grs.

Extractum Gelsemii Alcoholicum

A semi-solid extract, prepared by exhausting gelsemium with spirit and water, and evaporating the tincture.

Dose— $\frac{1}{2}$ to 2 grs. in pill.

 This maximum B.P. dose of 2 grs. is dangerous.

Tinctura Gelsemii 2½ oz. to 1 pint.


2½ oz. gelsemium in No. 40 powder, macerated and percolated with 1 pint proof spirit.

Dose—5 to 20 minims.

GENTIANÆ RADIX (Gentian Root)—Gentianaceæ.

The tough, wrinkled, or ringed brownish-yellow, dried root of *Gentiana lutea*, in cylindrical pieces or longitudinal slices.

Bitter Tonic, without astringency. Dose—10 to 30 grs.

 This root is often confounded with Belladonna and Pyrethrum. From the former it is distinguished by its brownish-yellow colour, and by the close, transverse markings, which give it a ringed appearance. It differs from pyrethrum in its toughness, and in the absence of the black, shining points seen in the thick, brittle bark. Gentian is bitter, while pyrethrum causes a prickling sensation in the mouth.

Extractum Gentianæ

A brownish-black, soft extract, prepared by infusing and afterwards boiling the root in water and evaporating.

Dose—2 to 10 grs. A harmless excipient for pill masses.

Infusum Gentianæ Compositum 55 grs. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

55 grs. each gentian root and bitter-orange peel, and $\frac{1}{4}$ oz. fresh lemon peel, infused in 10 oz. boiling water.

Dose—I to 2 oz.

Tinctura Gentianæ Composita $1\frac{1}{2}$ oz. to 1 pint.

A golden-brown liquid, prepared by macerating and percolating with 1 pint proof spirit $1\frac{1}{2}$ oz. gentian, $\frac{3}{4}$ oz. bitter-orange peel, and $\frac{1}{4}$ oz. cardamom seeds.


Dose— $\frac{1}{2}$ to 2 drs.

GLUSIDUM (Gluside) C_6H_4CO,SO_2,NH

(Synonyms—Glucusimide; Benzoyl-sulphonicimide), commonly called Saccharin.

An intensely sweet white crystalline powder, being an imide derived from the toluene of coal tar.

Only used as a substitute for sugar.

 Soluble Saccharin is prepared by evaporating a neutral solution of gluside in bicarbonate of soda.

GLYCERINUM (Glycerine) $C_3H_5(HO)_3$

A colourless, oily-looking, thick, sweet fluid, obtained from fats and fixed oils, and containing a small percentage of water.

Demulcent, Antiseptic, and Emollient. Dose—I to 2 drs.

Suppositoria Glycerini 70 per cent.

Translucent cones, prepared by soaking gelatine $\frac{1}{2}$ oz. in a little water till it becomes soft, and then dissolving it in glycerine $2\frac{1}{2}$ oz. and evaporating till the mixture weighs 1,560 grs., when it is poured into moulds capable of holding 30, 60, and 120 grs. each. Each suppository contains 70 per cent. of glycerine.


Used for inserting into the rectum for constipation.

In addition to entering into the 8 Glycerines, it enters into Lin. Iodi, and Lin. Pot. Iod. cum Sapone, Ext. Cinchonæ Liq., Mel Boracis, Pil. Aloes et Myrrh., Pil. Rhei Co. and Pil. Saponis Co., Tinct. Kino, Ungt. Iodi, and the Lamellæ.

Glycerinum Acidi Carbolici, &c. (See under Acidum Carbolic., &c.; or the table upon page 140).**GLYCYRRHIZÆ RADIX** (Liquorice Root)—Leguminosæ.

The pale-yellow, tough, fibrous root or underground stem or stolon, in long cylindrical, branched pieces, *fresh and dried*, of Glycyrrhiza glabra.

Demulcent; but chiefly used for its sweetening qualities.

 This root is distinguished from others by its *yellow* and *fibrous* interior, and by its very sweet taste.

A mild Cathartic.

Extractum Glycyrrhizæ

A firm, black extract, prepared by maceration of the root in cold distilled water, and subsequent evaporation.

Chiefly used as an excipient. Dose—5 grs. to 1 dr.

IN—Confect. Sennæ, Dec. Aloes Co., Tinct. Aloes, and Troch. Opii.

Extractum Glycyrrhizæ Liquidum

A dark liquid, prepared by evaporating a cold infusion of the root till the specific gravity of 1.16 is reached, and then adding $\frac{1}{8}$ its volume of rectified spirit.

Dose—1 dr.

IN—Mist. Sennæ Co. and Tr. Chloroform. et Morphinæ.

Pulvis Glycyrrhizæ Compositum 1 in 6.

(Synonym—Pulvis Glycyrrhizæ Compositus cum Sulphure).

A greenish powder, consisting of senna and liquorice, of each 2 oz., fennel and sulphur, of each 1 oz., sugar 6 oz.

A mild Cathartic. Dose—30 to 60 grs.

In addition to the above, liquorice root enters into Confect. Terebinth., Dec. Sarsæ Co., Infus. Lini, Pil. Hydrarg., and Pil. Ferri Iod.

GOSSYPIUM (Cotton Wool or Cotton)—Malvaceæ.

White, soft filaments or hairs of the seed of *Gossypium barbadense*, and other species of gossypium; with fatty matter and impurities removed.

Used in making Pyroxylin.

GRANATI RADICIS CORTEX (Pomegranate Root Bark)
Myrtaceæ.

The greyish-yellow fragments of the dried bark of the root of *Punica Granatum*—outer surface wrinkled, inner smooth.

Anthelmintic; used to destroy the tapeworm.

Decoctum Granati Radicis 2 oz. to 1 pint.

Prepared by taking 2 oz. of the bark of the root of the pomegranate and 2 pints of water, and boiling down to 1 pint.

Dose—2 to 4 oz. every four hours. It causes purging.

GUAIACI LIGNUM (Guaiacum Wood)—Zygophyllaceæ.

The raspings or small chips, of a yellow or dark greenish colour, of the heart-wood of *Guaiacum officinale*, or of *G. sanctum*. (Known as *Lignum Vitæ*.)

Diaphoretic and Alterative.

IN—Decoct. Sarsæ Co.

GUAIACI RESINA (Guaiacum Resin).

The resin from the stem of *Guaiacum officinale*, or of *G. sanctum*, in large greenish-brown masses or oval tears, obtained by natural exudation, by incision, or by heat.

Diaphoretic and Antisyphilitic. Dose—10 to 30 grs.

Mistura Guaiaci 11 grs. in 1 oz.

An emulsion, prepared by rubbing $\frac{1}{2}$ oz. of guaiacum resin, $\frac{1}{2}$ oz. sugar, $\frac{1}{4}$ oz. gum acacia, with 1 pint cinnamon water.

Dose— $\frac{1}{2}$ to 2 oz.

Tinctura Guaiaci Ammoniata 4 oz. to 1 pint.

A dark-brown liquid, prepared by macerating 4 oz. of guaiacum resin in 1 pint aromatic spirit of ammonia for 7 days.

Stimulant and Diaphoretic. Dose— $\frac{1}{2}$ to 1 dr.

In addition to the above, the resin enters into Pil. Hydrarg. Subchlor. Co.

GUTTA PERCHA (Gutta Percha)—Sapotaceæ.

The concrete juice, in tough, light-brown, flexible pieces, of *Dichopsis Gutta* (*Isonandra Gutta*) and other sapotaceous trees.

Liquor Gutta Percha 1 in 8.

A nearly colourless thick fluid, prepared by dissolving 1 oz. gutta percha in 6 oz. chloroform, and adding 1 oz. carbonate of lead mixed with 2 oz. more chloroform, and decanting.

A good substitute for flexible collodion.

It forms the basis of Charta Sinapis.

HÆMATOXYLI LIGNUM (Logwood)—Leguminosæ.

The dark-red logs or iridescent chips or raspings of the heart-wood of *Hæmatoxylon campechianum*.

A pure Astringent. Dose—10 to 30 grs., in powder.

Decoctum Hæmatoxyli 1 oz. to 1 pint.

Prepared by boiling 1 oz. logwood in 1 pint distilled water for 10 minutes, adding 55 grs. cinnamon near the end of the process, and making the strained product to measure 1 pint.

Dose—1 to 2 oz.

Extractum Hæmatoxyli

A brittle, deep-red *solid*, prepared by boiling down an infusion of logwood to dryness. Dose—10 to 30 grs., dissolved in water.

HAMAMELIDIS CORTEX (Hamamelis Bark)—Hamamelidaceæ.

(Synonym—Witch Hazel Bark).

The dried bark of *Hamamelis virginica* in quills or curved pieces 2 to 8 inches long; externally scaly, whitish, or silvery grey; internally cinnamon-brown and striated.

Tinctura Hamamelidis 1 in 10.

Prepared by macerating and percolating 2 oz. witch hazel bark with 1 pint proof spirit.

Astringent. Dose—5 to 60 minims.

Hamamelidis Folia

The dried leaves of *Hamamelis virginica* or witch hazel. Oval, 4 to 6 inches long, with an oblique, heart-shaped base.

Extractum Hamamelidis Liquidum 1 in 1.

Prepared by a mixed process of percolation and maceration by exhausting the powdered leaves in spirit and water, reserving a portion of the resulting tincture, evaporating the remainder to the consistence of a soft extract, and dissolving it in the reserved portion.

Astringent. Dose—2 to 5 minims.

Unguentum Hamamelidis 1 in 10.

Prepared by mixing 50 mins. liquid extract of hamamelis with 410 grs. simple ointment.

An Astringent application for inflamed piles.

HEMIDESMI RADIX (*Hemidesmus*)—*Asclepiadaceæ*.

The brownish, cylindrical, tortuous dried root of *Hemidesmus indicus*, marked with annular cracks; sometimes called Indian Sarsaparilla. Supposed to possess the properties of Sarsaparilla.

Syrupus Hemidesmi 1 in 8 (by measure).

A deep-brown syrup, prepared by dissolving 28 oz. sugar in an infusion of 4 oz. hemidesmus root in 1 pint boiling water.

Dose—1 dr. Used as a pleasant addition to cough mixtures.

HIRUDO (The Leech)—Class *Annelida*.

Two leeches are official—the *Hamburgh* or green leech (*Sanguisuga officinalis*) and the speckled or English leech (*S. medicinalis*), the former having a dark-olive and the latter a greenish-yellow spotted belly. Both species have six rusty-red longitudinal stripes on the back, which distinguish them from the horse-leech and others.

HOMATROPINÆ HYDROBROMAS (Hydrobromate of Homatropine) $C_{16}H_{21}NO_3, HBr$

The hydrobromate of an alkaloid prepared from trophine, in minute colourless crystals.

Mydriatic and Anhidrotic. Dose— $\frac{1}{80}$ to $\frac{1}{20}$ gr.

HORDEUM DECORTICATUM (Pearl Barley)—*Graminaceæ*.

The white, rounded, husked seeds of *Hordeum distichon*. From plants cultivated in Britain.

Demulcent and Nutrient.

Decoctum Hordei 1 in 10. (Product about a pint.)

Prepared by boiling 2 oz. washed pearl barley for twenty minutes in $1\frac{1}{2}$ pint of water. (Known as Barley Water.)

Dose—1 to 4 ozs. or *ad libitum*.

HYDRARGYRUM (Mercury) Hg

A lustrous fluid metal $13\frac{1}{2}$ times heavier than water.

Hydrargyrum cum Creta 1 in 3.

A greyish-blue powder, commonly called "grey powder," prepared by rubbing 1 oz. mercury with 2 oz. prepared chalk.

Alterative. Dose—3 to 8 grs. For a child 1 year old, 1 gr.

Emplastrum Hydrargyri 1 in 3.

A bluish solid, prepared by rubbing 3 oz. mercury with a heated mixture of 56 grs. olive oil and 8 grs. sulphur, and adding 6 oz. melted lead plaster (the sulphur aiding the division of the mercury).

Resolvent. This preparation sometimes affects the system.

Emplastrum Ammoniaci cum Hydrargyro 1 in 5 of Hg.

A dirty-blue coloured solid, composed of 3 oz. mercury, 12 oz. ammoniacum, 56 grs. olive oil, and 8 grs. sulphur.

Resolvent and Local Stimulant.

Linimentum Hydrargyri 1 in 3 of Ungt., 1 in 6 of Hg.

A thick, lead-coloured liquid, composed of mercurial ointment, solution of ammonia, and camphor liniment, of each 1 oz.

A Stimulant to chronic enlargements.

Pilula Hydrargyri 1 in 3. (Synonym—Blue Pill).

Prepared by rubbing 2 oz. mercury with 3 oz. confection of roses, and adding 1 oz. liquorice in fine powder.

Dose—3 to 8 grs.

Suppositoria Hydrargyri 5 grs. ointment in each.

Prepared by melting together ointment of mercury 60 grs., oil of theobroma 120 grs., and pouring into 12 conical moulds.

Unguentum Hydrargyri 1 in 2.

Prepared by rubbing together 1 lb. of mercury, 1 lb. of lard, and 1 oz. suet. Called sometimes Blue ointment, from its colour.

Used to introduce mercury into the system through the skin.

~~16~~ There are 8 ointments bearing the name of mercury. (Page 159.)

Unguentum Hydrargyri Compositum 1 of Hg. in $4\frac{1}{2}$.

A bluish ointment, consisting of ointment of mercury 6 oz., yellow wax and olive oil, of each 3 oz., camphor $1\frac{1}{2}$ oz.

This is a substitute for Scott's ointment, by which name it is also known.

Hydrargyri Iodidum Rubrum HgI₂

(Synonyms—Hydrargyri Binioidum ; Mercuric Iodide).

A crystalline vermillion powder, precipitated on mixing hot solutions of perchloride of mercury and iodide of potassium.

Irritant and Vesicant. Dose— $\frac{1}{32}$ to $\frac{1}{8}$ gr., in pill.

Unguentum Hydrargyri Iodidi Rubri 16 grs. to 1 oz.

A brilliant red ointment, prepared by mixing 16 grs. of red iodide of mercury with 1 oz. simple ointment.

Absorbent and Rubefacient.

Liq. Arsenii et Hydrargyri Iodidi

Donovan's Solution. (See Acid. Arsenios., page 197).

Liquor Hydrargyri Nitratis Acidus 48 per cent.

(Synonyms—Acid Solution of Mercuric Nitrate; Acid Solution of Pernitrate of Mercury). A colourless solution of 4 oz. mercury in 5 oz. nitric acid and $1\frac{1}{2}$ oz. distilled water.

Caustic; not used internally.

Unguentum Hydrargyri Nitratis 1 in 16 nearly.

(Synonym—Unguentum Citrinum). Prepared by adding a solution of 4 oz. mercury in 12 oz. nitric acid to a hot mixture of 15 oz. lard and 32 oz. olive oil.

A local Alterative, Astringent, and Stimulant.

Unguentum Hydrargyri Nitratis Dilutum 1 in 3.

1 oz. nitrate of mercury ointment and 2 oz. soft paraffin.

Oleatum Hydrargyri (Oleate of Mercury).

A light brown oleaginous semi-solid, prepared by triturating 1 oz. yellow oxide of mercury with 9 oz. oleic acid.

Action same as that of Ointment of Mercury.

Hydrargyri Oxidum Flavum HgO

(Synonym—Yellow Mercuric Oxide). A yellow powder, prepared by mixing solutions of perchloride of mercury and soda, washing and drying the precipitate.

Used in Ophthalmia of the eyelids (6 grs. to 1 oz. lard).

It has the same composition as the following, only it exists in a state of more minute division; it is used in making Hydrarg. Oleatum.

Hydrargyri Oxidum Rubrum HgO

(Synonyms—Red Mercuric Oxide; Hydrargyri Nitrico-Oxidum).—Called also Red Precipitate. An orange-red powder, prepared by heating dry mercuric nitrate (obtained by evaporating a solution of mercury in nitric acid) with Hg.

Dose— $\frac{1}{4}$ to $\frac{3}{4}$ gr., in pill; seldom given internally.

Unguentum Hydrargyri Oxidi Rubri 62 grs. to 1 oz.

A red ointment, composed of red oxide of mercury 62 grs., hard paraffin $\frac{1}{4}$ oz., and soft paraffin $\frac{3}{4}$ oz., melted together.

A local Stimulating Absorbent.

Hydrargyri Perchloridum (Perchloride of Mercury) HgCl_2

(Synonyms—Mercuric Chloride; Corrosive Sublimate; Hydrargyrum Corrosivum Sublimatum; Hydrargyri Bichloridum).—In

heavy colourless masses of prismatic crystals, prepared by subliming a mixture of persulphate of mercury, chloride of sodium, and black oxide of manganese.

Alterative. In even small quantity an irritant poison.

Dose— $\frac{1}{16}$ to $\frac{1}{8}$ grain in plain solution.

Liquor Hydrargyri Perchloridi $\frac{1}{2}$ gr. in 1 oz.

A colourless solution of 10 grs. corrosive sublimate and 10 grs. sal ammoniac in 1 pint distilled water.

Dose— $\frac{1}{2}$ to 2 drachms, diluted. Each drachm contains $\frac{1}{16}$ gr.

Lotio Hydrargyri Flava 18 grs. to 10 oz.

"Yellow Wash." Prepared by adding 18 grs. corrosive sublimate to 10 oz. lime water (the yellow oxide— HgO —falls as a precipitate).

Resembles the yellow and red oxides in action.

Hydrargyri Subchloridum (Subchloride of Mercury) HgCl

(Synonyms—Calomelas; Hydrargyri Chloridum; Calomel; Mercurous Chloride). A dull-white heavy powder, prepared by subliming mercurous sulphate (obtained by rubbing mercuric sulphate and mercury together) with dried chloride of sodium, and washing the sublimate in boiling water.

Alterative, Purgative, and Diuretic.

Dose— $\frac{1}{2}$ to 5 grs.; for a child 1 year old, 1 gr.

Lotio Hydrargyri Nigra 3 grs. to 1 oz.

"Black Wash." Prepared by adding 30 grs. calomel to 10 oz. lime water, the black precipitate formed being Hg_2O .

A Stimulating Alterative to syphilitic sores.

Pilula Hydrargyri Subchloridi Composita 1 in 5.

(Synonym — Pilula Calomelanos Composita)—An orange mass, prepared by beating together 1 oz. calomel, 1 oz. sulphurated antimony, 2 oz. guaiacum resin, and 1 oz. castor oil. Known also as Plummer's Pill.

Dose—5 to 10 grs., as an Alterative and feeble Cathartic.

Unguentum Hydrargyri Subchloridi 80 grs. to 1 oz.

A yellowish-white ointment, prepared by mixing 80 grs. subchloride of mercury (calomel) and 1 oz. benzoated lard.

Alterative and Resolvent, but seldom used.

Hydrargyri Persulphas HgSO_4

(Synonyms — Hydrargyri Sulphas; Sulphate of Mercury; Mercuric Sulphate). — A white, heavy, crystalline powder, prepared by heating 20 oz., by weight, of mercury with 12 oz. sulphuric acid. Used for making calomel and corrosive sublimate.

trivial

Hydrargyrum Ammoniatum NH_2HgCl

(Synonyms — Hydrargyri Ammonio-chloridum ; Hydrargyri Præcipitatum Album ; Chloride of Mercuric - ammonium). Known also as White Precipitate. A white powder, prepared by mixing solutions of perchloride of mercury and of ammonia, and washing the precipitate.

Used as an Insecticide, and never taken internally.

Unguentum Hydrargyri Ammoniatum 1 in 10.

(Synonym — Ointment of White Precipitate). — 50 grs. ammoniated mercury mixed with 450 grs. simple ointment.

A Stimulant in chronic skin diseases, and to destroy pediculi.

HYDRASTIS RHIZOMA (Hydrastis Rhizome)—Ranunculaceæ.

(Synonym—Golden Seal). The dried, twisted, and knotted yellowish-brown rhizome and rootlets of Hydrastis Canadensis.

Tonic and Alterative to mucous membranes.

Extractum Hydrastis Liquidum 1 in 1.

Prepared by a mixed process of percolation and maceration by exhausting the rhizome with spirit and water, reserving a portion of the resulting tincture and evaporating the remainder to the consistence of a soft extract, and then dissolving this in the reserved portion.

Dose—5 to 30 minims.

Tinctura Hydrastis 1 in 10.

Prepared by macerating and percolating 2 oz. hydrastis rhizome in 20 oz. proof spirit.

Dose—20 to 60 minims.

HYOSCYAMI FOLIA (Henbane Leaves)—Solanaceæ.

The sinuated, hairy, *dried* leaves of Hyoscyamus niger, also the *fresh* leaves, with their branches—gathered from *biennial* wild or cultivated British plants when two-thirds of the flowers are expanded.

Narcotic, Anodyne, and Sedative.

Extractum Hyoscyami

A dark soft mass, prepared by the evaporation of the juice of the fresh leaves and branches of henbane, by a process identical with that used for making the Extract of Aconite.

Dose—5 to 10 grs.

Pil. Colocynthis et Hyoscyami (See Colocynth.)**Succus Hyoscyami**

The juice of the fresh leaves and young branches of biennial plants, to which $\frac{1}{3}$ of its volume of rectified spirit is added.

Dose— $\frac{1}{2}$ to 1 dr.

Hy - Root

Tinctura Hyoscyami $2\frac{1}{2}$ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. henbane leaves with 1 pint proof spirit.

Dose— $\frac{1}{2}$ to 1 dr.

ODOFORMUM (Iodoform) CHI_3

Shining lemon-yellow crystalline scales, produced by the action of iodine on a mixture of alcohol and solution of carbonate of potassium.

Antiseptic and Alterative. Dose— $\frac{1}{2}$ to 3 grs. in pill.

Suppositoria Iodoformi 3 grs. in each.

Iodoform 36 grs., oil of theobroma 144 grs., divided into 12 suppositories.

Unguentum Iodoformi 1 in 10.

Iodoform 1 oz. added to melted benzoated lard 9 oz.

Disinfectant, Antiseptic, and Antisyphilitic.

IODUM (Iodine) I

A non-metallic element, in dark, lustrous, laminar crystals, obtained from the ashes of sea-weeds, and from mineral iodides, and iodates.

Lymphatic Stimulant, Absorbent, Alterative, and Caustic.

Starch and free ammonia are incompatible with iodine preparations.

Linimentum Iodi 1 dr. to 1 oz. (1 in 9)

A dark, reddish-brown liquid, prepared by dissolving iodine $2\frac{1}{2}$ oz., iodide of potassium 1 oz., glycerine $\frac{1}{2}$ oz., in rectified spirit 1 pint. 5 times the strength of the tincture.

Absorbent and Counter-irritant.

Liquor Iodi 22 grs. in 1 oz.

A brownish-red liquid, prepared by dissolving iodine 22 grs., and iodide of potassium 33 grs. in distilled water to 1 oz.

Acts like the liniment, only weaker.

Tinctura Iodi 11 grs. to 1 oz.

A deep-red liquid, prepared by dissolving iodine $\frac{1}{2}$ oz., iodide of potassium $\frac{1}{2}$ oz., in rectified spirit 1 pint.

Dose—5 to 20 minims, diluted; used in making Vapor Iodi.

Unguentum Iodi 1 in 31, or 14 grs. in 1 oz.

A brown ointment, prepared by rubbing iodine 16 grs., iodide of potassium 16 grs., with glycerine $\frac{1}{2}$ dr., and lard 1 oz.

Resolvent, Alterative, and Irritant.

Vapor Iodi 1 dr. tincture to 1 oz. water.

Mixed in a suitable apparatus, and heat applied, so that the vapour may be inhaled.

Laryngeal Sedative.

Iodides of Sodium, Arsenic, Iron, Mercury, Potassium, Sulphur, and Lead, and their preparations are given under the name of each metal.

IPECACUANHA (Ipecacuanha)—Cinchonaceæ.

The dried root of *Cephaelis Ipecacuanha*, in small annular, contorted, brown, worm-like pieces. Known also as Hippo.

Dose— $\frac{1}{2}$ to 2 grs. as an Expectorant, 10 grs. as an Hepatic Stimulant, and 15 to 30 as an Emetic. For a child 1 year old, as an Expectorant, $\frac{1}{12}$ to $\frac{1}{4}$ gr. ; as an Emetic, 2 to 4 grs.

In addition to the following, Ipecacuanha enters into Pil. Conii Co.

Acetum Ipecacuanhæ 1 oz. to 1 pint

Prepared by macerating and percolating 1 oz. ipecacuanha in 20 oz. dilute acetic acid.

Dose as an Expectorant, 5 to 40 mins.

Pilula Ipecacuanhæ cum Scilla 1 in 23.

Composed of compound powder of ipecacuanha 3 oz., squill and ammoniacum, of each 1 oz., treacle q.s., beaten into a mass.

Expectorant, Diaphoretic, Diuretic. Dose—5 to 10 grs.

Pulvis Ipecacuanhæ Compositus 1 in 10.

(Known as Dover's Powder)—a fawn-coloured powder, composed of opium $\frac{1}{2}$ oz., ipecacuanha $\frac{1}{2}$ oz., sulphate of potassium 4 oz.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

Trochisci Ipecacuanhæ $\frac{1}{4}$ gr. in each.

Ipecacuanha 180 grs., sugar 25 oz., gum acacia 1 oz., mucilage 2 oz., water q.s., in 720 (fawn-coloured) lozenges.

Dose—1 to 3 lozenges as an Expectorant.

Trochisci Morphinæ et Ipecacuanhæ $\frac{1}{36}$ and $\frac{1}{12}$ gr.

Hydrochlorate of morphine 20 grs., ipecacuanha 60 grs., tincture of tolu $\frac{1}{2}$ oz., sugar 24 oz., water $\frac{1}{2}$ oz., gum acacia 1 oz., mucilage q.s., in 720 (white-coloured) lozenges.

Action similar to Dover's powder. Dose—1 to 6 lozenges.

Vinum Ipecacuanhæ 1 oz. to 1 pint (22 grs. in 1 oz).

A brownish liquid, prepared by macerating 1 oz. ipecacuanha in 1 oz. acetic acid, and percolating with 1 pint distilled water, evaporating the resulting liquid to dryness, and macerating the residue in 1 pint sherry.

Dose—5 to 40 mins. as an Expectorant. 3 to 6 drs. as an Emetic. Emetic dose for a child 1 year old—1 dr.

JABORANDI (Jaborandi)—Rutaceæ.

(Synonym—*Pilocarpi Foliola*).—The dried, shortly-stalked, coriaceous, oblong leaflets of *Pilocarpus pennatifolius*, 4 or more inches in length.

Sialagogue, Diuretic, Diaphoretic, and Expectorant.

Dose—5 to 60 grs., in powder. (See *Pilocarpine*.)

Extractum Jaborandi

A soft extract, prepared by exhausting jaborandi with proof spirit and water, and evaporating the resulting tincture.

Dose—2 to 10 grs.

Infusum Jaborandi $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

$\frac{1}{2}$ oz. jaborandi (cut small) infused in 10 oz. boiling water.

Dose—I to 2 oz.

Tinctura Jaborandi 5 oz. to 1 pint.

Prepared by macerating and percolating 5 oz. jaborandi, in No. 40 powder, with 1 pint proof spirit. Dose— $\frac{1}{2}$ to 1 dr.

JALAPA (Jalap)—Convolvulaceæ.

The dried tuberous root, in brown, wrinkled, dense, ovoid tubercles, from a pigeon's to a turkey's egg in size, of *Ipomœa Purga* (*Exogonium Purga*).

Drastic Purgative.

Dose—10 to 30 grs. 1 to 2 grs. for a child 1 year old.

Extractum Jalapæ 1 from 2.

A dark-brown extract, obtained by evaporating a strong tincture of jalap root, and also by evaporating a cold infusion made from the marc of the tincture, mixing the two extracts thus obtained, and continuing the evaporation. Dose—5 to 15 grs., in pill.

Pulvis Jalapæ Compositus 1 in 3.

A powder closely resembling Dover's in appearance, composed of jalap 5 oz., cream of tartar 9 oz., and ginger 1 oz. *Jalap, ginger cream of tartar*

Hydragogue Cathartic. Dose—20 to 60 grs. *20 to 60, 1 in 3*

Tinctura Jalapæ $2\frac{1}{2}$ oz. to 1 pint.

A deep-brown liquid, prepared by macerating and percolating $2\frac{1}{2}$ oz. jalap, in No. 40 powder, with 1 pint proof spirit.

Dose— $\frac{1}{2}$ to 2 drs.

In addition to the above, Jalap enters into Pulv. Scammonii Co.

Jalapæ Resina

A dark-brown, shining solid, in opaque brittle fragments, prepared by exhausting jalap with spirit, evaporating and precipitating the resin from the resulting concentrated tincture by adding water, washing and drying on a water-bath.

More powerful than jalap. Dose—2 to 5 grs.

Enters into Pilula Scammonii Co.

JUNIPERI OLEUM (Oil of Juniper)—From Coniferæ.

The colourless or pale yellow oil distilled in Britain from the full-grown, unripe green fruit of *Juniperus communis*.

A Stimulating Diuretic. Dose—I to 4 minims.

Spiritus Juniperi 1 in 50.

Oil of Juniper 1 oz and rectified spirit 49 oz.

Dose— $\frac{1}{2}$ to 1 dr.

IN—Mistura Creasoti.

KAMALA (Kamala)—From Euphorbiaceæ.

A granular, red, sand-like powder, consisting of the minute glands and hairs from the surface of the fruits of *Mallotus philippinensis* (*Rottlera tinctoria*).

Cathartic and Anthelmintic. Used to kill *tænia solium*.

Dose— $\frac{1}{2}$ to 2 drs., swallowed in milk or gruel.

KINO (Kino)—From Leguminosæ.

The inspissated juice, in small angular, glistening, dark-red pieces, from incisions in the trunk of *Pterocarpus Marsupium*.

Astringent (contains 70 to 80 per cent. of tannin).

Dose—10 to 30 grs. It should not be ordered with iron.

In addition to the following, Kino enters into Pulv. Catechu Co.

Pulvis Kino Compositus 3 in 4.

Composed of kino $3\frac{3}{4}$ oz., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent, Anodyne, and Narcotic. Dose—5 to 20 grs.

Tinctura Kino 2 oz. to 1 pint.

A reddish-brown liquid, prepared by macerating kino 2 oz., in glycerine 3 oz., distilled water 5 oz., rectified spirit 12 oz.

Dose— $\frac{1}{2}$ to 2 drs.

KRAMERIÆ RADIX (Rhatany Root)—Polygalaceæ.

The dried root of (1) Peruvian Rhatany—*Krameria triandra*; or of (2) Savanilla Rhatany—*K. Ixina*, *var. granatensis* (*K. Tomentosa*). The first is in thick pieces, covered with reddish-brown scaly bark; the second is in smaller and less knotty pieces of a violet or purplish colour, with inseparable bark.

Astringent and Tonic. (Contains much tannin).

Dose—10 to 30 grs. It should not be ordered with iron.

In addition to the following, Rhatany enters into Pulv. Catechu Co.

Extractum Krameriaë

A deep reddish-brown, *solid* extract, obtained by exhausting rhatany root with water, and evaporating the liquid to *dryness*.

Dose—5 to 20 grs., in pill, or rubbed up with chalk mixture.

Infusum Krameriaë $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

Rhatany root $\frac{1}{2}$ oz. infused in boiling water 10 oz.

Dose—I to 2 oz.

Tinctura Krameriaë $2\frac{1}{2}$ oz. to 1 pint.

A deep-red liquid, prepared by macerating and percolating rhatany root in No. 40 powder $2\frac{1}{2}$ oz., with proof spirit 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

LAC (the fresh milk of the cow, *Bos Taurus*).

Used in making *Mistura Scammonii*.

LACTUCA (Lettuce)—*Compositæ*.

The flowering herb of *Lactuca virosa*.

Extractum Lactucae

A dark extract, prepared by evaporating the juice of the fresh flowering herb (as in the case of *Extract of Aconite*).

Feebly Anodyne and Narcotic. Dose—5 to 15 grs.

LARICIS CORTEX (Larch Bark)—*Coniferæ*.

In red quills or flat pieces, of *Pinus Larix* (*Abies Larix*), collected in spring, deprived of its outer rough portion, and dried. *omit*

A Stimulating Astringent. (Checks profuse expectoration.)

Tinctura Laricis $2\frac{1}{2}$ oz. to 1 pint.

A dark-red liquid, prepared by macerating and percolating larch bark $2\frac{1}{2}$ oz., in No. 40 powder, with rectified spirit 1 pint.

Dose—20 to 30 minims.

LAUROCERASI FOLIA (Cherry-Laurel Leaves)—*Rosaceæ*.

The elliptical, smooth, shining, thick, deep-green, *fresh* leaves of *Prunus Laurocerasus*—the common or cherry laurel.

Aqua Laurocerasi 1 lb. to 1 pint. (.1 per cent.)

A colourless liquid, prepared by distilling 1 pint from 1 lb. fresh cherry-laurel leaves and $2\frac{1}{2}$ pints water, and making its strength correspond to .1 per cent. real hydrocyanic acid.

Sedative. Dose— $\frac{1}{2}$ to 2 drs.

LAVANDULÆ OLEUM (Oil of Lavender)—*Labiatae*.

The almost colourless oil distilled in Britain from the flowers of *Lavandula vera*.

Carminative and Antispasmodic. Dose—1 to 4 mins.

IN—Linim. Camph. Co.

Spiritus Lavandulæ 1 in 50.

Oil of lavender 1 oz. and rectified spirit 49 oz.

Dose— $\frac{1}{2}$ to 1 dr.

Tinctura Lavandulæ Composita 45 minims to 1 pint. *1. in 2 1/2*

(Synonym — *Spiritus Lavandulæ Compositus*).—A bright crimson liquid, prepared by macerating cinnamon and nutmeg of each 75 grs. and red sandal-wood 150 grs. in rectified spirit 1 pint for 7 days, filtering, and adding oil of lavender 45 min. and oil of rosemary 5 min.

Dose— $\frac{1}{2}$ to 2 drs.

Used to colour *Liquor Arsenicalis*. *(oral)*

LIMONIS CORTEX (Lemon Peel)—Aurantiaceæ.

(Synonym—Limonis Pericarpium)—The outer part of the rind of the fresh fruit of Citrus Limonum.

Aromatic ; chiefly used for its flavour.

It enters into Inf. Aurant. Co. and Inf. Gent. Co. and the following :—

Oleum Limonis

The pale yellow, fragrant *volatile* oil obtained by mechanical means from the fresh lemon peel.

Dose—I to 4 minims, but chiefly used for flavouring.

IN—Lin. Pot. Iod. cum Sapone, Spt. Ammon. Aromat., Mist. Ol. Ricini.

Succus Limonis 36 to 46 grs. citric acid in 1 oz.

The freshly expressed juice of the ripe fruit of Citrus Limonum. A slightly turbid yellowish liquid.

Refrigerant and Antiscorbutic. Dose— $\frac{1}{2}$ to 2 oz.

Syrupus Limonis 1 of juice in 2.

A yellowish syrup, prepared by infusing fresh lemon peel 2 oz. in boiling lemon juice 1 pint, and adding $2\frac{1}{4}$ lb. sugar.

Dose—I dr.

It enters into Liquor Magnesii Citratis.

Tinctura Limonis $2\frac{1}{2}$ oz. to 1 pint.

A sherry-coloured liquid, prepared by macerating fresh lemon peel $2\frac{1}{2}$ oz. in proof spirit 1 pint for 7 days.

Dose— $\frac{1}{2}$ to 2 drs.

LINI SEMINA (Linseed)—Linaceæ.

The small, shining, oval, brown, pointed seeds of Linum usitatissimum—common flax.

Demulcent, Emollient, and Nutrient.

Lini Farina (Linseed Meal)—Linaceæ.

Powdered linseed. In all the poultices except yeast.

Cataplasma Lini

Linseed meal 4 oz. gradually mixed with boiling water 10 oz.

Infusum Lini 150 grs. to 10 oz. (2 hours).

Prepared by infusing for *two* hours linseed 150 grs., dried liquorice root 50 grs., boiling water 10 oz.

Dose—2 to 5 oz.

Oleum Lini (Linseed Oil).

The viscid oil expressed in Britain without heat from linseed. Only used externally as an Emollient.

LITHII CARBONAS (Carbonate of Lithium) L_2CO_3

In a white powder, or in minute crystalline grains.

Diuretic and Antacid. Dose—3 to 6 grs.

Sip - Food.

Sip - O. J. C. Linseed oil

Liquor Lithiæ Effervescens 10 grs. to 1 pint.

(Synonyms—Aqua Lithiæ Effervescens; Lithia Water). Carbonate of lithium 10 grs. in water 1 pint, charged at a pressure of four atmospheres with washed carbonic acid gas.

Dose—5 to 10 oz.

Lithii Citras (Citrates of Lithium) $\text{L}_3\text{C}_6\text{H}_5\text{O}_7, 4\text{H}_2\text{O}$

(Synonyms—Lithiæ Citras; Citrate of Lithia). A white crystalline salt, prepared by adding carbonate of lithium to a solution of citric acid till effervescence ceases, evaporating and setting aside for crystals to form. Acts like the carbonate.

Dose—5 to 10 grs. in solution, freely diluted.

LOBELIA (Lobelia)—Lobeliaceæ.

The dried flowering herb of *Lobelia inflata* (Indian Tobacco), in compressed rectangular parcels of angular stems, alternate toothed hairy leaves and inflated fruits.

Tinctura Lobeliæ 2½ oz. to 1 pint.

A greenish-brown liquid, prepared by macerating and percolating lobelia 2½ oz. in No. 40 powder, with proof spirit 1 pint.

Diuretic, Expectorant, Emetic, and Antispasmodic.

Dose—10 to 30 minims.

Tinctura Lobeliæ Ætherea 2½ oz. to 1 pint.

A green liquid, prepared by *macerating* lobelia 2½ oz. in coarse powder in spirit of ether 1 pint for 7 days.

Dose 10 to 30 minims.

LUPULUS (Hop)—Cannabinaceæ. (Synonym—Humulus).

The dried, greenish-yellow strobiles or membranous cones of *Humulus Lupulus*, from plants cultivated in England.

A Bitter Tonic and feeble Narcotic.

LUPULINUM (Lupulin) (Synonym—Lupulinic Glands).

A granular, bright yellow glandular powder, obtained from the dried strobiles of *Humulus Lupulus*.

Tonic, Anodyne, and Hypnotic. Dose—2 to 5 grs.

Extractum Lupuli

The dark-brown, soft extract, prepared by evaporating a tincture of hop, making a decoction of the marc, which is likewise to be evaporated; the spirituous and aqueous extracts to be mixed, and the evaporation continued.

Dose—5 to 15 grs., in pill.

Infusum Lupuli ½ oz. to 10 oz. (1 hour).

Prepared by infusing hop ½ oz. in boiling water 10 oz.

Dose—1 to 2 oz.

Tinctura Lupuli $2\frac{1}{2}$ oz. to 1 pint.

A deep-red liquid, prepared by macerating and percolating hop $2\frac{1}{2}$ oz. with proof spirit 1 pint. Dose— $\frac{1}{2}$ to 2 drs.

MAGNESIA PONDEROSA (Heavy Magnesia) **MgO**

(Synonyms—Heavy Calcined Magnesia; Oxide of Magnesium). A white insoluble powder, prepared by calcining heavy carbonate of magnesium in a loosely covered crucible.

Antacid, Laxative, and Antilithic.

Dose—10 to 60 grs., in milk. May be used in Pulvis Rhei Co.

Magnesia Levis (Light Magnesia) **MgO**

(Synonyms—Light Calcined Magnesia; Oxide of Magnesium). A bulky, white, insoluble powder, identical with the preceding, only lighter, bulk for bulk, in the ratio of $3\frac{1}{2}$ to 1.

Prepared by calcining light carbonate of magnesium.

Dose—10 to 60 grs. In—Pulvis Rhei Compositus.

Magnesii Carbonas Ponderosa (MgCO_3)₃, $\text{Mg}(\text{HO})_24\text{H}_2\text{O}$

(Heavy carbonate of magnesium) (Synonym—Magnesiæ Carbonas). A white granular powder, prepared by mixing *strong* hot solutions of sulphate of magnesium and carbonate of sodium, washing and drying the precipitate by a heat not exceeding 212° .

Dose—10 to 40 grs. as an Antacid, 1 to 2 drs. as a Purgative.

IN—Liq. Magnes. Carb. and Troch. Bismuthi.

Magnesii Carbonas Levis (MgCO_3)₃, $\text{Mg}(\text{HO})_24\text{H}_2\text{O}$

(Light carbonate of magnesium) (Synonym—Magnesiæ Carbonas Levis.) A very light, partially amorphous powder, prepared by mixing *weak* cold solutions of sulphate of magnesium and carbonate of sodium, boiling, washing the precipitate, and drying by a heat not exceeding 212° .

Dose—10 to 60 grs. Used in Vapor Olei Pini Sylvestris.

Liquor Magnesii Carbonatis 10 grs. in 1 oz.

A colourless liquid, prepared by boiling together a solution of sulphate of magnesium 2 oz. in water 10 oz., and a solution of carbonate of sodium $2\frac{1}{2}$ oz. in water 10 oz., washing carefully the precipitated carbonate of magnesium, mixing it with distilled water 1 pint, and passing pure carbonic acid gas, at three pressures, through it till dissolved. Known as "Fluid Magnesia," which is also its official Synonym.

Antacid. Dose—1 to 2 oz.; $\frac{1}{2}$ dr. for a child 1 year old.

Liquor Magnesii Citratis About 16 grs. Mag. Cit. in 1 oz.

(Synonym—Effervescing Solution of Citrates of Magnesium and Potassium).—Dissolve citric acid 200 grs. in water 2 oz., add

carbonate of magnesium 100 grs., filter into a strong half-pint bottle, add syrup of lemons $\frac{1}{2}$ oz., fill up with water, add bicarbonate of potassium 40 grs., in crystals, and cork quickly, tying down with wire.

Antacid and Cathartic. Dose—5 to 10 oz.

Magnesii Sulphas $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$

(Synonyms—Magnesiæ Sulphas; Sulphate of Magnesia; Epsom Salt).—In minute, colourless, rhombic prisms; 3 oz. dissolve in 4 oz. water.

Hydragogue Purgative. Dose—I to 4 drs.

In addition to the following, it enters into Mist. Sennæ Co., 1 in $5\frac{1}{2}$.

Magnesii Sulphas Effervescens 1 in 2.

(Synonym—Effervescent Epsom Salt).—Prepared by drying 25 oz. Epsom salt and mixing it with 18 oz. bicarbonate of sodium, $9\frac{1}{2}$ oz. tartaric acid, $6\frac{1}{4}$ oz. citric acid, and $5\frac{1}{4}$ oz. sugar, all in powder, heating between 200° and 220° F., and stirring assiduously till the powder becomes granulated. The product should weigh 50 oz.

Cathartic and Antacid. Dose— $\frac{1}{4}$ to 1 oz.

Enema Magnesii Sulphatis 1 in 16.

Composed of sulphate of magnesium 1 oz., olive oil 1 oz., mucilage of starch 15 oz.—for 1 enema.

MANGANESII OXIDUM NIGRUM (Black Oxide of Manganese) MnO_2

A heavy, black powder, used in producing Cl. and KMnO_4 .

MANNA (Manna)—Oleaceæ.

A concrete saccharine exudation from transverse incisions in the stems of cultivated trees of *Fraxinus Ornus*, in stalactiform, porous, uneven, dirty-white pieces. *omit*

Laxative; chiefly used for children.

Dose—I dr. to 1 oz.; 10 to 20 grs. for a child 1 year old.

MARMOR ALBUM (White Marble) CaCO_3 *omit*

Crystalline native carbonate of lime, in hard, white masses.

Used for producing carbonic acid gas.

MASTICHE (Mastich)—Anacardiaceæ.

A resinous exudation, in small, irregular, brittle, yellow tears; obtained by incision from the stem of *Pistacia Lentiscus*. *omit*

Chiefly used for its physical properties in pill masses.

MATICÆ FOLIA (Matico Leaves)—Piperaceæ.

The dried, long, pointed leaves, with a square network of intersecting veins on their surface, of *Piper angustifolium* (*Artanthe elongata*), 4 to 8 inches long, and hairy. *omit*

Tonic and Styptic. Dose— $\frac{1}{2}$ to 1 dr., in powder.

Infusum Maticæ $\frac{1}{2}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

Matico leaves $\frac{1}{2}$ oz., infused in boiling water 10 oz.

Dose—1 to 4 oz.

MEL (Honey).

A viscid, translucent, brownish-yellow liquid, gradually becoming opaque and crystalline, being the saccharine secretion deposited in the honeycomb by *Apis mellifica*, the hive bee.

Demulcent and Laxative. Dose—1 dr. to 1 oz.

Mel Depuratum (Clarified Honey).

Honey strained whilst hot through wetted flannel.

Enters into Confections of Pepper, Scammony, and Turpentine, and

Mel Boracis (Borax Honey) 46 grs. in 1 oz.

Prepared by rubbing borax 60 grs. with clarified honey 480 grs., and glycerine 30 grs.

Alterative to diseased mucous surfaces.

Oxymel (Oxymel) 4 in 5.

A thick syrupy liquid, composed of clarified honey 40 oz., acetic acid 5 oz., water 5 oz., mixed with heat.

Expectorant, but chiefly used as a vehicle. Dose—1 to 2 drs.

Oxymel Scillæ (Oxymel of Squill).

An opalescent brownish liquid, composed of vinegar of squill 1 pint, clarified honey 2 lbs., evaporated till of the S.G. of 1.32.

Expectorant. Dose— $\frac{1}{2}$ to 1 dr.

MENTHÆ PIPERITÆ OLEUM (Oil of Peppermint).

The colourless or pale yellow oil distilled in Britain from the fresh flowering herb of *Mentha piperita*.—(Labiatae).

Antispasmodic and Carminative. Dose—1 to 4 minims.

It enters into Pil. Rhei Co., Tr. Chlorof. et Morph., and the following:—

Aqua Menthæ Piperitæ 1 $\frac{1}{2}$ dr. to 1 gallon.

A colourless liquid, prepared by mixing oil of peppermint 1 $\frac{1}{2}$ drs. with water 1 $\frac{1}{2}$ gallons, and distilling 1 gallon.

Dose—1 to 2 oz.; 1 dr. for a child 1 year old.

IN—Mistura Ferri Aromatica.

Essentia Menthæ Piperitæ 1 in 5.

Oil of peppermint 1 oz. dissolved in rectified spirit 4 oz.

Dose—10 to 20 mins. 2 to 4 mins. for a child 1 year old.

Spiritus Menthæ Piperitæ 1 in 50.

Oil of peppermint 1 oz. and rectified spirit 49 oz.

Dose— $\frac{1}{2}$ to 1 dr.

MENTHÆ VIRIDIS OLEUM (Oil of Spearmint).

The colourless or pale-yellow oil distilled in Britain from the fresh flowering herb of *Mentha viridis*.—(Labiatae).

Action and dose similar to peppermint.

Aqua Menthæ Viridis $1\frac{1}{2}$ dr. to 1 gallon.

A colourless liquid, obtained by mixing oil of spearmint $1\frac{1}{2}$ drs. and water $1\frac{1}{2}$ gallons, and distilling 1 gallon.

Dose—1 to 2 oz.; 1 dr. for a child 1 year old.

MENTHOL (Menthol) $C_{10}H_{20}O$

A stearoptene in colourless crystals, or in fused crystalline masses, obtained by cooling the oil distilled from *Mentha arvensis*, vars. *piperascens* et *glabrata*; and of *M. piperita*.

Antiseptic and Antineuralgic.

Dose— $\frac{1}{2}$ to 2 grs., in pill; or rubbed on the skin as a local Anæsthetic. Sometimes called Peppermint Camphor.

Emplastrum Menthol 1 in 5.

Prepared by melting together 1 oz. yellow wax and 7 oz. resin, and stirring in 2 oz. menthol.

Local Anodyne.

MEZEREI CORTEX (Mezereon Bark)—Thymelaceæ.

The dried bark, in tough brown strips or quilled pieces of various lengths, of *Daphne Mezereum* or of *Daphne Laureola*.

Vesicant and Alterative.

Dose—10 to 15 grs. Seldom used internally.

Enters into Dec. Sarsæ Co. 55 grs. to 1 pint.

Extractum Mezerei Æthereum

A dark-green soft extract, prepared by evaporating a strong tincture of mezereon and macerating the residue with ether, which is poured off, filtered, and evaporated.

Enters into Lin. Sinapis Co. 8 grs. to 1 oz.

MICA PANIS (Bread Crumb).

The soft crumb of bread. Enters into Cataplasma Carbonis.

MORI SUCCUS (Mulberry Juice)—Urticaceæ, or Moraceæ.

The purple juice of the ripe mulberry, *Morus nigra*.

Laxative and Refrigerant.

Syrupus Mori 1 in 2.

A deep-red syrup, prepared by dissolving $2\frac{1}{4}$ lbs. sugar in 1 pint mulberry juice, and adding $2\frac{1}{2}$ oz. spirit.

Dose—1 dr.

MORPHINÆ ACETAS (Acetate of Morphine) $C_{17}H_{19}NO_3 \cdot HC_2H_3O_2 \cdot 3H_2O$ (Synon.—Acetate of Morphia).

A white soluble powder, prepared by mixing solutions of hydrochlorate of morphine and ammonia, and thus precipitating pure morphine, which, when washed, is dissolved in acetic acid and water, and the solution, on evaporation, yields acetate of morphine. May be prepared from pure morphine.

Anodyne and Narcotic. Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr.

Liquor Morphinæ Acetatis 1 in 100.

An almost colourless liquid, prepared by dissolving acetate of morphine 9 grs. in distilled water 12 drs., to which rectified spirit 4 drs. and dilute acetic acid 18 minims have been added.

Dose—10 to 60 minims.

It may also be prepared by diluting the following :—

Injectio Morphinæ Hypodermica 1 gr. in 10 minims.

A clear solution, prepared by adding solution of ammonia to hydrochlorate of morphine 92 grs. dissolved in water 2 oz., so that all the morphine is thrown down; the washed precipitate is then carefully dissolved in water, with enough acetic acid to make a slightly acid solution, which is to measure 2 oz.

Dose—Subcutaneously, commencing with 1 to 2 minims.

Morphinæ Hydrochloras (Hydrochlorate of Morphine) $C_{17}H_{19}NO_3 \cdot HCl \cdot 3H_2O$ (Synonyms—Hydrochlorate of Morphia; Morphiæ Murias).

In white, fine, silky prisms, obtained by a process from opium, of which the following is an outline :—

Opium is thoroughly exhausted by water, and the solution concentrated. To this, chloride of calcium is added, which produces meconate of calcium and hydrochlorate of morphine, and the liquid is evaporated till solidification occurs. Out of this solid cake the impure hydrochlorate is washed repeatedly with hot water, the solution digested with animal charcoal to destroy its colour, and precipitated by ammonia, which throws down pure morphine. This is washed and suspended in hot water, and hydrochloric acid added to form a neutral solution, out of which the salt crystallises on cooling.

Action, dose, and strength similar to the acetate of morphine.

Liquor Morphinæ Hydrochloratis 1 in 100.

A colourless liquid, prepared by dissolving hydrochlorate of morphine 9 grs. in distilled water 12 drs., rectified spirit 4 drs., and dilute hydrochloric acid 18 mins. Dose—10 to 60 minims.

Liquor Morphinæ Bimeconatis $1\frac{1}{4}$ in 100.

A nearly colourless solution of Bimeconate of Morphine ($C_{17}H_{19}NO_3, C_7H_4O_7$), prepared by dissolving 9 grs. hydrochlorate of morphine in water, precipitating with ammonia, and adding to the pure morphine thus thrown down 6 grs. meconic acid, 4 drs. spirit, and water $1\frac{1}{2}$ oz.

Action same as acetate of morphine.

Dose—5 to 40 minims. It is of the same strength as Tr. Opii.

Suppositoria Morphinæ $\frac{1}{2}$ gr. in each.

Composed of hydrochlorate of morphine 6 grs., and oil of heobroma 174 grs., in 12 conical suppositories.

Suppositoria Morphinæ cum Sapone $\frac{1}{2}$ gr. and $8\frac{1}{2}$ grs.

Composed of hydrochlorate of morphine 6 grs., glycerine of starch 30 grs., curd soap 100 grs., powdered starch q.s. to make suitable paste, which is to be divided into 12 cones.

Trochisci Morphinæ $\frac{1}{36}$ gr. in each.

White lozenges, composed of hydrochlorate of morphine 20 grs., tincture of tolu $\frac{1}{2}$ oz., sugar 24 oz., powdered gum acacia 1 oz., water $\frac{1}{2}$ oz., mucilage of acacia q.s., in 720 lozenges.

Dose—I to 6 lozenges.

Trochisci Morphinæ et Ipecacuanhæ $\frac{1}{36}$ and $\frac{1}{12}$ gr.

White lozenges, prepared by adding 60 grs. of ipecacuanha to the quantities in the preceding before dividing.

Dose—I to 6 lozenges.

Tinctura Chloroformi et Morphinæ. (See page 234.)**MORPHINÆ SULPHAS** ($C_{17}H_{19}NO_3)_2, H_2SO_4, 5H_2O$

(Synonym—Sulphate of Morphia). Colourless silky crystals, obtained as in the process for the hydrochlorate by diffusing the morphine in boiling water, and adding sulphuric acid to form a neutral solution from which the salt will crystallise.

Dose— $\frac{1}{8}$ to $\frac{1}{2}$ gr. Acts like the hydrochlorate and acetate.

Liquor Morphinæ Sulphatis 1 in 100.

Sulphate of Morphine 35 grs. dissolved in distilled water 8 oz., and rectified spirit 2 oz. Dose—10 to 60 minims.

 1 gr. Morphine is contained in 10 grs. powdered opium.

MORRHUÆ OLEUM (Cod-Liver Oil).

The pale-yellow oil extracted from the fresh liver of the cod—adus Morrhua—by a heat not exceeding 180° .

A Nutritive Tonic. Dose—I to 8 drs., in emulsion, or in milk.

MOSCHUS (Musk).

The dried secretion from the preputial follicles of Moschus moschiferous, in small, irregular, reddish-black grains.

Stimulant and Antispasmodic. Dose—5 to 10 grs.

MYRISTICA (Nutmeg)—Myristicaceæ.

The oval, furrowed dried seed of *Myristica fragrans* (*M. officinalis*) divested of its hard coat or shell; the transverse section has a marbled appearance.

Carminative and Narcotic. Dose—5 to 10 grs.

In addition to the following, Nutmeg enters into the composition of Pulv. Catechu Co., Pulv. Cretæ Arom., Spt. Armoraciæ Co., and Tinct. Lavand. Co.

Oleum Myristicæ (*Volatile Oil of Nutmeg*).

The pale-yellow oil distilled in Britain from nutmeg.

Dose—I to 4 minims, on sugar.

Enters into Pil. Aloes Socot., Spt. Ammon. Aromat., and Spt. Myristicæ.

Oleum Myristicæ Expressum (*Expressed Oil of Nutmeg*).

(Synonym—*Myristicæ Adeps*). A concrete, yellow, soft solid, obtained by expression and heat from nutmeg.

Enters into the composition of Emp. Calefaciens, and Emp. Picis.

Spiritus Myristicæ I in 50.

Volatile oil of nutmeg 1 oz. and rectified spirit 49 oz.

Dose— $\frac{1}{2}$ to 1 dr.

Enters into Mistura Ferri Composita.

MYRRHA (*Myrrh*)—Amyridaceæ.

A gum-resinous exudation, in irregular brownish-yellow or red tears or masses, from the stem of *Balsamodendron Myrrha*.

Emmenagogue and Expectorant. Dose—10 to 30 grs.

Enters into Dec. Aloes Co., Mist. Ferri Co., Pil. Aloes et Myrrhæ, Pil. Asafætidæ Co. and Pil. Rhei Co.

Tinctura Myrrhæ $2\frac{1}{2}$ oz. to 1 pint.

A pale-brown liquid, prepared by macerating and percolating myrrh $2\frac{1}{2}$ oz. with rectified spirit 1 pint.

Dose— $\frac{1}{2}$ to 1 dr., in sherry, or in emulsion.

NECTANDRÆ CORTEX (*Bebeeru Bark*)—Lauraceæ.

In large, flat, heavy, greyish-brown pieces, 1 to 2 feet long 2 to 6 inches broad, and $\frac{1}{4}$ inch thick, from *Nectandra Rodiæi*.

Antiperiodic and Tonic; somewhat resembling quinine, but only used in the preparation of *Beberinæ Sulphas*.

NITROGLYCERINI TABELLÆ (Tablets of Nitroglycerine).

Tablets of chocolate, each weighing $2\frac{1}{2}$ grs., and containing $\frac{1}{100}$ gr. pure nitroglycerine.

Dose—I or 2 tablets; action like Amyl Nitris.

Liquor Nitroglycerini (*Solution of Trinitrin*) 1 in 100.

(Synonyms—*Liquor Trinitrini*; *Liquor Glonoini*; *Solution*

Nitroglycerine or of Glonoin). A colourless liquid, consisting of pure nitroglycerine 1 part, rectified spirit 99 parts.
Antispasmodic, like Nitrite of Amyl. Dose— $\frac{1}{2}$ to 2 mins.

NUX VOMICA (Nux Vomica)—Loganiaceæ.

The circular, button-shaped seeds, about 1 inch in diameter, covered with short, satiny hairs, of *Strychnos Nux-vomica*.

Tonic, and Stimulant to the Spinal Cord.

Dose— $\frac{1}{2}$ to 3 grs., in powder. It is the source of Strychnine.

Extractum Nucis Vomicæ

A brown extract, prepared by evaporating a strong spirituous tincture of nux vomica till the resulting extract be estimated carefully to contain *15 per cent. of total alkaloids*.

Dose— $\frac{1}{4}$ to 1 gr.

Tinctura Nucis Vomicæ 1 gr. of Alkaloids in 1 oz.

A sherry-coloured liquid, prepared by dissolving 133 grs. extract nux vomica in 4 oz. water and 16 oz. rectified spirit.

Dose—10 to 20 minims.

OLIVÆ OLEUM (Olive Oil)—Oleaceæ.

The yellow oil expressed from the ripe fruit of *Olea europæa*.

Dose—2 drs. to 1 oz. as a Laxative.

IN—Charta Epispast., 1 enema, 5 plasters, 4 ointments, and 3 liniments.

OPIUM (Opium)—Papaveraceæ.

The juice inspissated by spontaneous evaporation obtained by incision, from the unripe capsules of the poppy—*Papaver somniferum*, grown in Asia Minor—in irregular lumps of from $\frac{1}{2}$ to 2 lbs., enveloped in fragments of poppy leaves, and scattered over with the chaffy fruits of a species of *Rumex*; when fresh, tearing with an irregular, moist, brown surface; 100 grs. of the dry powder should yield about 10 grs. morphine; but any opium is officially permitted as a source of alkaloids.

Anodyne and Narcotic. Dose— $\frac{1}{2}$ to 3 grs.

Pulvis Opii Opium in powder (of a rich brown colour).

Although it is not recognised under a separate heading, it is inserted here to remind the student that opium cannot be powdered until it is first thoroughly dried, and that in drying it loses water, and in grinding there is a further loss of inert woody fibrous impurities, and the powder is stronger than the fresh opium by about $\frac{1}{8}$, 7 grains being equal to 8 of opium.

Confectio Opii 1 in 40.

A soft brown mass, composed of compound powder of opium 100 grs. rubbed with syrup 300 grs.

Anodyne and Carminative. Dose—5 to 20 grs.

Emplastrum Opii 1 in 10.

A hard brown solid, prepared by heating resin plaster 9 oz., and adding, by degrees, powdered opium 1 oz.

Enema Opii $\frac{1}{2}$ dr. tinct. to 2 oz.

A thick opaque liquid, prepared by mixing tincture of opium $\frac{1}{2}$ dr. with mucilage of starch 2 oz. For one enema.

Extractum Opii 1 from 2. (20 per cent. Morphine.)

A dark-brown, tough extract, prepared by evaporating a cold infusion of 1 lb. opium, till the product weighs $\frac{1}{2}$ lb.

Dose— $\frac{1}{2}$ to 2 grs. It is much stronger than powdered opium, and is said to be less stimulating.

IN—Trochisci Opii, Vinum Opii, and

Extractum Opii Liquidum 22 grs. Extract in 1 oz.

A dark-brown liquid, consisting of extract of opium 1 oz., dissolved in distilled water 16 oz., and rectified spirit 4 oz.

Dose—10 to 40 mins., should yield 1 per cent. morphine.

~~103~~ Though slightly weaker, this is regarded as the representative of Battley's Sedative Liquor.

Linimentum Opii 1 in 2.

An almost black liquid, consisting of equal parts laudanum and soap liniment.

Pilula Ipecacuanhæ cum Scilla 1 in 23.

A brown mass, composed of Dover's powder 3 oz., squill 1 oz., ammoniacum 1 oz., treacle q.s., beaten together.

Narcotic and Expectorant. Dose—5 to 10 grs.

Pilula Plumbi cum Opio 1 in 8.

A brownish-black mass, composed of acetate of lead 36 grs., opium in powder 6 grs., and confection of roses 6 grs.

Astringent as well as Narcotic. (Should be made fresh.)

Dose—3 to 5 grs.

Pilula Saponis Composita 1 in 6. (Synonym—Pilula Opii).

A light-brown mass, composed of opium in powder $\frac{1}{2}$ oz., hard soap 2 oz., glycerine q.s., beaten together.

Dose—3 to 5 grs.

Pulvis Cretæ Aromaticus cum Opio 1 in 40.

A pale-brown powder, composed of opium $\frac{1}{4}$ oz., aromatic chalk powder $9\frac{3}{4}$ oz.

Carminative and Anodyne; well adapted for children.

Dose—10 to 40 grs.; for a child 1 year old, $\frac{1}{2}$ to 1 gr.

Pulvis Ipecacuanhæ Compositus 1 in 10.

A fawn-coloured powder, composed of ipecacuanha and opium of each $\frac{1}{2}$ oz., sulphate of potassium 4 oz. Commonly known as Dover's powder.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

IN—Pilula Ipecacuanhæ cum Scilla.

Pulvis Kino Compositus 1 in 20.

A dark-red powder, composed of kino $3\frac{3}{4}$ oz., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent and Narcotic. Dose—5 to 20 grs.

Pulvis Opii Compositus 1 in 10.

A brown powder, composed of opium $1\frac{1}{2}$ oz., black pepper 2 oz., ginger 5 oz., caraway 6 oz., tragacanth $\frac{1}{2}$ oz.

Carminative and Narcotic. Dose—2 to 5 grs.

IN—Confectio Opii. 1 in 4, or 1 of opium in 40.

Suppositoria Plumbi Composita 1 gr. of opium in each.

Composed of acetate of lead 3 grs., opium 1 gr., oil of theobroma 11 grs. in each.

Tinctura Camphoræ Composita 2 grs. in 1 oz.

A sherry-coloured liquid, composed of *powdered* opium 40 grs., benzoic acid 40 grs., camphor 30 grs., oil of anise 30 minims, proof spirit 1 pint, macerated for seven days, and filtered. Commonly known as Paregoric.

Anodyne, Expectorant, and Stimulant.

Dose— $\frac{1}{4}$ to 1 dr.; for a child 1 year old, 4 minims. This is the only safe liquid preparation of opium for infants.

Tinctura Opii $1\frac{1}{2}$ oz. to 1 pint, or 33 grs. in 1 oz.

A dark reddish-brown liquid, prepared by macerating *powdered* opium $1\frac{1}{2}$ oz. in proof spirit 1 pint. Commonly known as Laudanum. Contains 3·3 grs. morphine in 1 oz.

Narcotic and Anodyne. Dose—5 to 40 minims.

IN—Enema Opii and Linimentum Opii.

Tinctura Opii Ammoniata 100 grs. to 1 pint.

A dark-brown liquid, prepared by macerating *powdered* opium 100 grs., saffron and benzoic acid of each 180 grs., oil of anise 1 dr., in strong solution of ammonia 4 oz. and rectified spirit 16 oz. Commonly known as Scotch Paregoric.

Anodyne and Expectorant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

Trochisci Opii $\frac{1}{10}$ gr. extract in each.

Brown lozenges, composed of extract of opium 72 grs., tincture of tolu $\frac{1}{2}$ oz., sugar 16 oz., gum acacia 2 oz., extract of liquorice 6 oz., distilled water q.s., divided into 720 lozenges.

Narcotic and Anodyne. Dose—1 to 6 lozenges.

Unguentum Gallæ cum Opio 32 grs. to 1 oz., or 1 in $14\frac{1}{2}$.

A brown ointment, prepared by rubbing up powdered opium 32 grs. with ointment of galls 1 oz.

A soothing Anodyne to painful hæmorrhoids.

Vinum Opii 22 grs. of extract in 1 oz.

A brown liquid, prepared by macerating for 7 days, extract of opium 1 oz., cinnamon and cloves of each 75 grs., in sherry 1 pint—same strength as the fluid extract.

Dose—10 to 40 minims.

The following preparations contain Opium, but under another name :—

Codeina ;	Pulvis Ipecacuanhæ Co. ;
Pilula Ipecacuanhæ cum Scilla ;	Pulvis Kino Co. ;
Pilula Plumbi cum Opio ;	Suppositoria Plumbi Composita ;
Pilula Saponis Co. ;	Tinct. Camphoræ Co. ;
Pulvis Cretæ Aromat. cum Opio ;	Ungt. Gallæ cum Opio.

OS USTUM (Bone Ash).

The residue of bones which have been burned to a white ash in contact with air, consisting of phosphate of calcium, with 10 per cent. carbonate of calcium and a little fluoride of calcium, silica, and phosphate of magnesium.

Used in the preparation of the phosphates of sodium and calcium.

OVI ALBUMEN (Egg Albumen).

Liquid white of the egg of Gallus Bankiva, *var. domesticus*.

OVI VITELLUS (Yolk of Egg).

Of Gallus Bankiva, *var. domesticus*.

Enters into Mistura Spiritus Vini Gallici.

OXYMEL and OXYMEL SCILLÆ (See under Mel and Scilla).

PAPAVERIS CAPSULÆ (Poppy Capsules)—Papaveraceæ.

The large, globular, crowned, dried, nearly ripe capsules of the white poppy, *Papaver somniferum*. Grown in Britain.

Anodyne and Narcotic ; resembling opium.

Decoctum Papaveris 2 oz. to 1 pint.

Prepared by boiling poppy capsules 2 oz. in distilled water 1½ pints for ten minutes, and making the strained product measure one pint.

Used as an Anodyne application to painful parts.

Extractum Papaveris

A brownish-black extract, prepared by evaporating 1 gallon of an infusion of the seedless capsules (made by displacement) to 1 pint, and adding 2 oz. rectified spirit, filtering, and continuing the evaporation till a proper consistence is reached.

Dose—2 to 5 grs., in pill.

Syrupus Papaveris 1 in 2½.

A dark-brown syrup, prepared by exhausting 36 oz. of bruised seedless poppy capsules with 2 gallons of boiling distilled water.

reducing the infusion to 3 pints by evaporation on a water-bath, and adding 16 oz. rectified spirit when cold; this liquid, after settling, is filtered, and the spirit distilled off till 2 pints are left behind, in which 4 lbs. sugar are to be dissolved.

Anodyne and Narcotic.

Dose—1 dr.; should not be given to very young children.

PARAFFINUM DURUM (Hard Paraffin).

(Synonyms—Paraffin; Paraffin Wax; Solid Paraffin).—A colourless, translucent, waxy-looking substance, melting between 110° and 145° F., being a mixture of several of the harder members of the paraffin series of hydrocarbons; obtained by distillation from shale, and purified after separation of the liquid oils by refrigeration.

Used as a basis for ointments, into 9 of which it enters.

PARAFFINUM MOLLE (Soft Paraffin).

(Synonyms—Petrolatum; Pétroléine; Unguentum Paraffinum).—A white or yellowish, translucent, semi-solid mixture of some of the softer or more fluid members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum, and known in commerce by various fanciful names, as Vaseline, &c.

Emollient and Protective. Enters into 11 ointments.

PARALDEHYDUM (Paraldehyde) $C_6H_{12}O_3$

A colourless liquid with a disagreeable ethereal odour and burning taste, being the product of the polymerisation of aldehyde by various acids or salts.

A true Hypnotic. Dose— $\frac{1}{2}$ to $1\frac{1}{2}$ drs.

PAREIRÆ RADIX (Pareira Root)—Menispermaceæ.

The dried root of *Chondrodendron tomentosum*, in long, cylindrical pieces, from $\frac{3}{4}$ to 3 inches thick, showing on cross section medullary rays and concentric rings.

Diuretic, and Anodyne to the mucous lining of the bladder.

Decoctum Pareiræ $1\frac{1}{4}$ oz. to 1 pint.

Prepared by boiling pareira root, in No. 20 powder, $1\frac{1}{4}$ oz. in distilled water, 1 pint for 15 minutes, and making the strained product to measure 1 pint.

Dose—1 to 2 oz.

Extractum Pareiræ

A black extract, prepared by exhausting pareira root with boiling water and evaporating the liquid on a water-bath.

Dose—10 to 30 grs.

Extractum Pareiræ Liquidum 1 in 4 of Extract.

A black liquid, prepared by dissolving 4 parts of the extract of pareira in a mixture of 1 part of spirit and 3 of water, to form 16 parts of liquid extract.

Dose— $\frac{1}{2}$ to 2 drs.

PEPSIN (Pepsin).

A light, yellowish-brown powder, prepared by pulverising the pulp (carefully dried under 100° by spreading on glass) obtained by scraping the mucous membrane of the fresh stomach of the pig, sheep, or calf.

Digestive. Dose—2 to 5 grs., in powder.

PHENACETINUM (Phenacetin) $C_{10}H_{13}NO_2$

Colourless, tasteless, inodorous scaly crystals produced by the action of glacial acetic acid on para-phenetidin, a body obtained from phenol.

Antipyretic and Analgesic. Dose—5 to 10 grs.

PHENAZONUM (Phenazone).

(Synonym—Phenyl-dimethyl-pyrazolone) $C_6H_5(CH_3)_2C_3HN_2O$

Colourless, inodorous, bitter scaly crystals very soluble in water; obtainable from phenyl-hydrazine, and commonly known as Antipyrine.

Antipyretic and Analgesic. Dose—3 to 20 grs.

PHOSPHORUS (Phosphorus) **P**

A semi-transparent, colourless, wax-like, solid, non-metallic element, prepared from bones.

Tonic and Restorative. Dose— $\frac{1}{30}$ gr. in pill.

Used in preparing dilute and concentrated Phosphoric Acid.

Oleum Phosphoratum 4 grs. to 1 oz., or about 1 per cent.

A clear, straw-coloured oil, phosphorescent in the dark, prepared by heating 4 oz. almond oil to 300° , filtering when cold, and dissolving 16 grs. phosphorus in it at a temperature of 180° .

Dose—5 to 10 minims—*i.e.*, $\frac{1}{24}$ to $\frac{1}{12}$ gr. of phosphorus.

Pilula Phosphori 1 in 90, including soap.

Prepared by rubbing together under water (at 140°) phosphorous 3 grs., balsam of tolu 120 grs., and yellow wax 57 grs., till thoroughly incorporated. The mass should be kept immersed in cold water, and 1 gr. of curd soap added to every 2 grs. of mass immediately before dispensing.

Dose—2 to 4 grs.—*i.e.*, $\frac{1}{45}$ to $\frac{2}{45}$ gr. of phosphorus.

PHYSOSTIGMATIS SEMEN (Calabar Bean)—Leguminosæ. (Synonym—Physostigmatis Faba).

The large, kidney-shaped, brown, dried seed, with a furrow along its convex margin, of *Physostigma venenosum*.

Local Myotic. Dose—1 to 4 grs., in powder or in pill.

Extractum Physostigmatis

A dark-brown soft extract, prepared by evaporating a strong tincture of Calabar bean made with rectified spirit.

Dose— $\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Physostigmina (Physostigmine) $C_{15}H_{21}N_3O_2$

(Synonym—Eserine). An alkaloid, in pinkish or colourless crystals, obtained by dissolving extract of Calabar bean in water, adding bicarbonate of sodium, shaking the mixture with ether, and evaporating the ethereal liquid. *omit*

A Myotic or pupil contractor.

Lamellæ Physostigminæ (Discs of Physostigmine).

Discs of gelatine, with some glycerine, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{1000}$ gr. physostigmine.

Used to cause contraction of the pupil.

PICROTOXINUM (Picrotoxin)—Menispermaceæ.

Colourless, inodorous, prismatic, bitter crystals, obtained from the seeds of Anamirta paniculata (Cocculus indicus) by exhausting them with alcohol, evaporating, and purifying.

Anhidrotic. Dose— $\frac{1}{100}$ to $\frac{1}{30}$ gr.

PILOCARPINÆ NITRAS (Nitrate of Pilocarpine)
 $C_{11}H_{16}N_2O_2, HNO_3$

An alkaloid, obtained from extract of jaborandi by agitation with chloroform and a little alkali, evaporating, neutralising with nitric acid and recrystallising. In minute acicular crystals, or as a white powder.

Diaphoretic, Sialagogue, Expectorant. Dose— $\frac{1}{20}$ to $\frac{1}{2}$ gr.

PIMENTA (Pimento)—Myrtaceæ.

The small, round, rough, brown, dried, unripe berries of the allspice tree—Pimenta officinalis (Eugenia Pimenta).

Stimulant and Carminative.

Aqua Pimentæ 14 oz. to 1 gallon.

A brownish unstable preparation, obtained by mixing allspice 14 oz. with water 2 gallons, and distilling off 1 gallon.

Dose—I to 2 oz.

Oleum Pimentæ

An oil (colourless when prepared, but soon becoming brown) distilled in Britain from pimento or allspice. *It sinks in water.*

Dose—I to 4 minims, in pill, or in sugar, or in an emulsion.

PINI SYLVESTRIS OLEUM (Fir-Wool Oil)—Coniferæ.

The nearly colourless oil, with aromatic odour, distilled from the fresh leaves of Pinus sylvestris—the Scotch fir.

Rubefacient and Astringent like turpentine.

Vapor Olei Pini Sylvestris 5 minims in each inhalation.

Prepared by mixing 40 minims fir-wood oil with 20 grs. light carbonate of magnesium and adding water to 1 oz. Of this 1 dr. is put into a suitable apparatus with $\frac{1}{2}$ pint of cold and $\frac{1}{2}$ pint of boiling water, and air passed through which may be afterwards inhaled.

PIPER NIGRUM (Black Pepper)—Piperaceæ.

The small, round, wrinkled, brownish-black, dried, unripe berries of *Piper nigrum*.

Carminative and Diuretic. Dose—10 to 20 grs.

It enters into Confect. Opii, Pulv. Opii Co., and the following:—

Confectio Piperis 1 in 10.

An almost black paste, prepared by mixing black pepper 2 oz., caraway fruit 3 oz., with honey 15 oz. Resembles and is sometimes called Ward's paste, and is in repute as an internal remedy for hæmorrhoids.

Dose—1 to 2 drs.

PIX BURGUNDICA (Burgundy Pitch)—From Coniferæ.

A hard, brittle, yellow solid, being a resinous exudation from the stem of *Pinus Picea* (*P. Abies*; *A. excelsa*) melted and strained. Seldom used except to impart solidity and rubefacient qualities to plasters.

It enters into Emplastrum Ferri and the following:—

Emplastrum Picis 1 in 2.

A yellow solid, composed of Burgundy pitch 26 oz., frankincense 13 oz., resin and yellow wax of each $4\frac{1}{2}$ oz., expressed oil of nutmeg 1 oz., olive oil and water of each 2 oz., melted, and evaporated with constant stirring.

A Rubefacient and Stimulating plaster.

PIX LIQUIDA (Tar)—From Coniferæ.

A thick, viscid, bituminous liquid, obtained by destructive distillation from the wood of *Pinus sylvestris* and other pines.

Expectorant. A Stimulating application (when diluted with wax, &c.) to chronic scaly skin affections.

Unguentum Picis Liquidæ 5 in 7.

A black ointment, prepared by melting yellow wax 2 oz., and adding tar 5 oz., and stirring whilst the mixture cools.

PLUMBI ACETAS (Acetate of Lead) $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}$

In white, crystalline, slightly efflorescent masses, obtained by dissolving oxide of lead 24 oz. in acetic acid 2 pints and distilled water 1 pint, with the aid of a gentle heat, filtering

evaporating, and setting aside till crystallisation takes place ; known as "sugar of lead."

Sedative and Astringent. Used in internal hæmorrhages.

Dose—1 to 4 grs., in solution or in pill.

Used in the preparation of Strychnine. As this salt forms insoluble precipitates, it should not be ordered with iodides, sulphates, or tannates.

Glycerinum Plumbi Subacetatis 1 in 6 by weight.

Prepared by boiling, filtering, and evaporating 5 oz. acetate of lead, $3\frac{1}{2}$ oz. oxide of lead, 1 pint glycerine, and 12 oz. water.

Astringent and local Sedative.

Unguentum Glycerini Plumbi Subacetatis

See table on next page.

Pilula Plumbi cum Opio 3 of lead and $\frac{1}{2}$ of opium in 4.

Prepared by beating into a mass acetate of lead 36 grs., opium 6 grs., confection of roses 6 grs.

Sedative, Narcotic, and Astringent. Dose—3 to 5 grs.

Suppositoria Plumbi Composita 3 grs. in each.

Prepared by mixing acetate of lead 36 grs., opium 12 grs., oil of theobroma 132 grs., and dividing into 12 cones.

Anodyne and Astringent. Each contains 1 gr. opium.

Unguentum Plumbi Acetatis See table on next page.

Liquor Plumbi Subacetatis 24 per cent. of $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2$

A colourless solution of subacetate of lead in water, prepared by boiling acetate of lead 5 oz. with oxide of lead $3\frac{1}{2}$ oz. in distilled water 1 pint. Sometimes called Goulard's Extract.

Powerfully Astringent, but only used diluted.

Liquor Plumbi Subacetatis Dilutus 2 drs. in 1 pint.

A colourless liquid (sometimes called Goulard's Water), prepared by mixing solution of subacetate of lead and rectified spirit of each 2 drs. with distilled water $19\frac{1}{2}$ oz.

An Astringent and local Sedative.

Plumbi Carbonas 2PbCO_3 & $\text{PbO}, \text{H}_2\text{O}$

A soft, heavy, white powder, known as "white lead," of somewhat variable composition ; not used internally ; externally, mildly Astringent. Used in making Liquor Gutta Percha.

For Ointment of Carbonate of Lead, see table on next page.

Plumbi Iodidum PbI_2

A bright yellow crystalline powder, prepared by mixing solutions of equal quantities of nitrate of lead and iodide of potassium, collecting, washing, and drying the precipitate.

Resolvent and Antiparasitic.

Emplastrum Plumbi Iodidi 1 in 10.

A bright yellow solid, composed of iodide of lead 2 oz., lead plaster 1 lb., and resin 2 oz.

Alterative and Resolvent to chronic enlargements.

For the Ointment of Iodide of Lead see table.

Plumbi Nitras $\text{Pb}(\text{NO}_3)_2$

In colourless, opaque, octahedral crystals, prepared by dissolving lead or litharge in nitric acid, and evaporating.

Used only to make the iodide.

Plumbi Oxidum PbO (Synonym—Litharge).

A heavy powder, in brick-red scales, obtained by roasting lead in a current of air.

Used in making Empl. Saponis Fuscum, Liq. Plumbi Subacetatis, Plumbi Acetas, Glycerinum Plumbi Subacetatis, and the following :—

Emplastrum Plumbi (Lead Plaster).

A pale-yellow solid, consisting of oleate, palmitate, and stearate of lead, and a little glycerine ; it is, chemically speaking, a *soap*. It is prepared by boiling in a steam-bath litharge (oxide of lead) 5 lbs., olive oil 10 lbs., and water 5 lbs., for 4 or 5 hours, till a proper consistence is obtained. Known as Diachylon or Litharge Plaster.

A supporting Sedative and Protective application.

It enters into 9 plasters either as lead or resin plaster.

 Of the 15 official plasters, 11 contain lead. The exceptions are—E. Ammon. c. Hydrarg., E. Cantharidis, E. Picis, and E. Menthol.

The following five plasters are often grouped together as the "Lead Plasters" :—Plumbi, Plumbi Iodidi, Resinæ, Saponis, and Saponis Fuscum.

The lead is in the form of oleate, palmitate and stearate, but chiefly as oleate. E. Saponis Fuscum contains some acetate of lead.

OINTMENTS OF LEAD.

UNGUENTUM.	COMPOSITION.	COLOUR.
Plumbi Acetatis .. $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_2, 3\text{H}_2\text{O}.$	Acetate in fine powder 12 grs., benzoated lard 1 oz.	White, 1 in $37\frac{1}{2}$.
Plumbi Carbonatis .. $2\text{PbCO}_3 \& \text{PbOH}_2\text{O}.$	Carbonate in fine powder 62 grs., simple ointment 1 oz.	Cream, 1 in 8
Plumbi Iodidi $\text{PbI}_2.$	Iodide in fine powder 62 grs. simple ointment 1 oz.	Orange, 1 in 8.
Glycerini Plumbi Subacetatis $\text{Pb}_2\text{O}(\text{C}_2\text{H}_3\text{O}_2)_2.$	Glycerine of subacetate $4\frac{1}{2}$ oz., soft paraffin 18 oz., hard paraffin 6 oz.	Cream, 1 in $6\frac{1}{2}$.

PODOPHYLLI RHIZOMA (Podophyllum Rhizome)—
Ranunculaceæ. (Synonym—Podophylli Radix).

The brown, wrinkled and knotted, dry rhizome, about the size of a quill, of Podophyllum peltatum. It is also known as Mayapple or Mandrake.

Hydragogue Cathartic. Dose—10 to 20 grs.

Podophylli Resina (Resin of Podophyllum).

A pale greenish-brown powder, prepared by pouring a concentrated spirituous tincture of podophyllum rhizome into water, when the resin is precipitated; it is afterwards washed and dried. It is commonly called Podophyllin.

Dose— $\frac{1}{4}$ to 1 gr. in pill; generally combined with aloes, &c.

Tinctura Podophylli 1 gr. in 1 dr.

Prepared by dissolving 160 grs. resin of podophyllum in 1 pint rectified spirit.

Dose—15 minims to 1 dr.

POTASSA CAUSTICA (Caustic Potash) **KHO**

(Synonyms—Potassæ Hydras; Potassa; Hydrate of Potash). In hard, white, deliquescent rods or pencils, prepared by evaporating Liquor Potassæ and pouring the concentrated residue into moulds. Soluble in $\frac{1}{2}$ its weight of water.

Acts as a powerful Caustic.

Is contained in Liquor Potassæ, and is used in making the Permanganate.

Liquor Potassæ 27 grs. caustic or hydrated Potash in 1 oz.

A colourless solution, prepared by boiling carbonate of potassium 1 lb. with slaked lime 12 oz. and distilled water 1 gallon, when carbonate of calcium is precipitated, and caustic potash remains in solution.

Antacid. Dose—15 to 60 minims, freely diluted.

Used in making the Bromide and Iodide of Potassium.

Potassa Sulphurata (Sulphurated Potash) **K₂S₃&K₂S₂O₃**

(Synonyms—Hepar Sulphuris; Potassii Sulphuretum). A mixture of salts of potassium, in dark-green or liver-coloured, hard, flat fragments, prepared by fusing together carbonate of potassium and sublimed sulphur.

Antiparasitic and Narcotic. Dose—3 to 5 grs.

Unguentum Potassæ Sulphuratæ 30 grs. to 1 oz.

A dirty-greenish ointment, prepared by mixing sulphurated potash 30 grs., hard paraffin $\frac{1}{4}$ oz., soft paraffin $\frac{3}{4}$ oz.

Antiparasitic. Used in scabies, &c.

***Potassii Acetas** $\text{KC}_2\text{H}_3\text{O}_2$

White, foliaceous, satiny, deliquescent masses, prepared by neutralising carbonate of potassium with acetic acid, evaporating to dryness, and liquefying the residue. Soluble in nearly $\frac{1}{3}$ its weight of water.

Diuretic and mildly Cathartic.

Dose—10 to 60 grs. ; 1 to 3 grs. for a child 1 year old.

Potassii Bicarbonas KHCO_3 (Synonym—Acid Carbonate of Potassium).

Colourless, right rhombic, prismatic crystals, obtained by saturating a strong aqueous solution of carbonate of potassium with carbonic acid gas, and recrystallising. Soluble in three times its weight of water.

Antacid, Sedative, Diuretic, and Antilithic.

Dose—10 to 40 grs., in solution. 20 grs. are neutralised by 14 grs. citric and 15 grs. tartaric acid.

Enters into Liquor Magnesii Citratis, and the following :—

Liquor Potassæ Effervescens 30 grs. to 1 pint.

(Synonyms—Aqua Potassæ Effervescens ; Potash Water). Being a solution of bicarbonate of potassium 30 grs. in 1 pint water, into which carbonic acid gas is driven under a pressure of 4 atmospheres before corking. Commonly called Kali Water.

Dose—5 to 10 oz.

Potassii Bichromas (Bichromate of Potassium)

$\text{K}_2\text{CrO}_4, \text{CrO}_3$ (Synonyms — Red Chromate ; or Anhydrochromate of Potassium). In large, red, transparent, four-sided tabular crystals.

Used in preparing Sodii Valerianas and Acid. Chromic.

Potassii Bromidum KBr

Colourless cubical crystals, obtained by adding bromine to liquor potassæ, which forms a solution of bromide and bromate of potassium. This is evaporated to dryness, and the residue fused with charcoal, which converts the bromate into bromide, which is dissolved out with distilled water, the solution concentrated, and allowed to deposit crystals.

Hypnotic, and Sedative to the nervous system and the larynx.

Dose—5 to 30 grs., in solution. Soluble—1 in 2 of water.

* The student will note the change in the new nomenclature of the potash and soda and other compounds introduced into the new P.B., the terminal “æ” now giving place to “ii ;” the neuter nouns potassium (-ii), sodium (-ii), &c., being substituted for potassa (-æ) and soda (-æ), and the English translation potassium and sodium instead of potash and soda. The latter terms—*i.e.*, potassæ and sodæ, and potash and soda—are still retained as synonyms.

Potassii Carbonas K_2CO_3 With 16 per cent. Water of Crystallisation. A white, crystalline, deliquescent powder, obtained from commercial pearl-ash by washing with its own weight of distilled water, and evaporating the solution so formed to dryness. It is soluble in $\frac{3}{4}$ of its weight of water.

Action and dose similar to the Bicarbonate.

It is used in the preparation of Atropina, Decoct. Aloes Co., Enema Aloes, Liquor Arsenicalis, Liquor Potassæ, Mist. Ferri Co., Potassa Sulphurata, Potassii Acetas, Potassii Bicarbonas, Potassii Chloras, Potassii Citras, Potassii Tartras, Potassii Ferrocyanid. and Pil. Ferri.

Potassii Chloras $KClO_3$

In colourless, rhomboidal crystalline plates, prepared by passing washed chlorine gas (generated by the action of hydrochloric acid on black oxide of manganese) through a moist mixture of carbonate of potassium and slaked lime. The chlorinated potassium so formed is converted into chlorate by boiling with water, and crystallises out on cooling after evaporation. 1 oz. is easily dissolved in 1 pint water.

Diuretic and Alterative to diseased mucous surfaces.

Dose—10 to 30 grs., in solution.

It is used in the preparation of Potassii Permanganas, and

Trochisci Potassii Chloratis 5 grs. in each.

White lozenges, consisting of chlorate of potassium, sugar, gum acacia, mucilage of gum acacia, and distilled water.

Dose—1 to 6 lozenges.

Potassii Citras $K_3C_6H_5O_7$

A white granular powder, prepared by neutralising a solution of citric acid with carbonate of potassium, filtering, and evaporating to dryness with constant stirring till the salt granulates.

A pleasant Refrigerant, Diaphoretic, and mild Laxative.

Dose—20 to 60 grs. in water (in which it is very soluble).

Potassii Cyanidum KCN

In white opaque deliquescent masses or plates having the odour of hydrocyanic acid, prepared by heating ferrocyanide of potassium at a red heat until gas ceases to be evolved, and pouring off the clear liquid after the sediment subsides in the molten mass.

A dangerous poison ; used in the P.B. to purify Bismuth.

Potassii Ferrocyanidum $K_4FeC_6N_6, 3H_2O$

(Synonyms—Potassæ Prussias Flava ; Yellow Prussiate of Potash). Large, transparent, yellow crystals, obtained by fusing refuse animal substances, such as cuttings of horns, hoofs, and skins, with carbonate of potassium in an iron pot, lixiviating the crude product with water, and purifying the salt by crystallisation.

Used only in the preparation of Acid. Hydrocyanicum Dilutum and KCN.

Potassii Iodidum KI

Colourless cubical crystals, obtained by adding iodine to liquor potassæ, which forms a solution of iodide and iodate. This is evaporated to dryness, the residue pulverised, mixed with charcoal and fused, and the product dissolved in distilled water, from which it is crystallised by evaporation.

Alterative and Resolvent in syphilis and scrofula.

Dose—2 to 20 grs. in pill or solution. Soluble in less than its own weight of water.

The following preparations contain this salt in the following quantities per 1 oz :—

Liniment. Iodi 22 grs.

Lin. Pot. Iod. cum. Sapone 54½ grs.

Liquor Iodi 33 grs.

Tinctura Iodi 11 grs.

Unguent. Iodi 16 grs. nearly.

Unguent. Potassii Iod. 50 grs.

Linimentum Potassii Iodidi cum Sapone 1 in 10 by W.

A cream-like substance, prepared by dissolving 2 oz. curd soap in 1 oz. glycerine and 10 oz. water on a water-bath, and triturating the solution with 1½ oz. iodide of potassium and adding 1 dr. of oil of lemon.

Alterative and Resolvent, and does not stain the skin.

Unguentum Potassii Iodidi 50 grs. in 1 oz., or 1 in 8¾.

A white ointment, prepared by dissolving iodide of potassium 64 grs. and carbonate of potassium 4 grs. in distilled water 1 drachm, and adding benzoated lard 1 oz.

Acts like the liniment.

Potassii Nitras KNO₃

In long, striated, prismatic crystals, or white crystalline masses, being nitrate of potassium of commerce, purified, if necessary, by crystallisation from solution in distilled water—commonly called nitre or saltpetre. Soluble 1 in 4 of water.

Diuretic and Diaphoretic. Dose—10 to 30 grs., in solution.

IN—Argenti et Potassii Nitras.

Potassii Permanganas KMnO₄

Dark-purple, slender, prismatic crystals, prepared by evaporating to dryness on a sand-bath a solution of caustic potash, to which black oxide of manganese and chlorate of potassium have been added; the resulting green mass of manganate of potassium is fused, boiled in water, and saturated with carbonic acid, and concentrated, crystals of permanganate of potassium form in it, which are purified by recrystallisation.

Antiseptic and Deodorant. Dose—1 to 5 grs.

As it destroys all organic substances and decomposes most inorganic, it should be given only in water or pill.

Liquor Potassii Permanganatis 1 in 100.

A deep-purple liquid, half the strength of Condyl's fluid, prepared by dissolving permanganate of potassium 88 grs. in distilled water 20 oz.

Dose—2 to 4 drs., in distilled water.

Potassii Sulphas K_2SO_4

In colourless, very hard, six-sided prisms, terminated by six-sided pyramids.

A mild Cathartic. Dose—60 grs.

IN—Pil. Colocynth. Co. and Pulv. Ipecac. Co., and their compounds.

Potassii Tartras $K_2C_4H_4O_6, H_2O$

Small, colourless, prismatic crystals, prepared from cream of tartar by neutralising it with carbonate of potassium in solution, concentrating, and drying the crystals which form.

Hydragogue Cathartic and Diuretic. Dose—60 grs. to $\frac{1}{2}$ oz.

Potassii Tartras Acida $KHC_4H_4O_6$

(Synonyms—Bitartrate of Potash ; Acid Tartrate of Potash ; Cream of Tartar). In a gritty, white powder, obtained from the crude tartar which is deposited during the fermentation of grape juice and from the lees of wine.

A Hydragogue Cathartic and Diuretic.

Dose—20 to 60 grs. As a purgative, $\frac{1}{2}$ to 1 oz. (1 pint of water only dissolves about 50 grs.) It is elegantly administered with twice its bulk of orange marmalade.

Used in preparing Tartaric Acid, Tartar Emetic, Confection and Lozenge of Sulphur, Compound Jalap Powder, Tartrates of Iron, Potash, and Soda.

PRUNUM (Prune)—Rosaceæ.

The oblong, black, shrivelled, dried drupe of *Prunus domestica*. Imported from the South of France.

A mild Laxative, entering into Confectio Sennæ.

PTEROCARPI LIGNUM (Red Sandal Wood)—Leguminosæ.

(Synonym—Red Sanders-Wood). Dense, heavy, dark, reddish-brown billets, raspings, or chips of the heart-wood of *Pterocarpus santalinus*. The powder is blood-red.

Used only for colouring Tinct. Lavandulæ Co.

PYRETHRI RADIX (Pellitory Root)—Compositæ.

The dried root of *Anacyclus Pyrethrum*, in unbranched pieces about the size of the little finger, with brown bark studded with black points. Easily recognised by the prickling sensation when chewed.

Powerful Sialagogue, greatly increasing the flow of saliva.

Tinctura Pyrethri 4 oz. to 1 pint.

A dark sherry-coloured liquid, prepared by macerating and percolating pellitory root 4 oz. with rectified spirit 1 pint.

Used locally to promote the flow of saliva.

PYROXYLIN (Pyroxylin).

Resembling cotton wool in appearance, and prepared by mixing sulphuric and nitric acids 5 oz. each, and immersing cotton wool 1 oz. in the mixture for three minutes, transferring it to a vessel of water, in which it is to be thoroughly washed, and dried on a water-bath. Commonly called Gun-cotton.

Enters into Collodium, Collodium Flexile, and Collodium Vesicans.

QUASSIÆ LIGNUM (Quassia Wood)—Simarubaceæ.

The yellowish-white shavings, chips, or raspings or large dense billets of *Picræna excelsa* (*Quassia excelsa*).

Bitter Tonic without Astringency; and, as it contains no tannin, it can be ordered with iron preparations.

Extractum Quassiæ

A black extract, prepared by evaporating a cold infusion of the wood. (Nearly 50 times the strength of the wood).

Dose—3 to 5 grs., in pill.

Infusum Quassiæ 55 grs. to 10 oz.—cold ($\frac{1}{2}$ hour).

Prepared by infusing quassia chips 55 grs. in cold distilled water 10 oz.

Dose—I to 2 oz.

Tinctura Quassiæ $\frac{3}{4}$ oz. to 1 pint.

A straw-coloured liquid, prepared by macerating quassia chips $\frac{3}{4}$ oz. in proof spirit 1 pint for 7 days.

Dose— $\frac{1}{2}$ to 2 drs.

QUERCUS CORTEX (Oak Bark)—Cupuliferæ.

The dried bark, with shining grey epidermis and brown interior, of the small branches and young stems of *Quercus Robur* (*Q. pedunculata*). Collected in spring in Britain.

Astringent, containing tannic and gallic acids.

Decoctum Quercus 1 $\frac{1}{4}$ oz. to 1 pint, or 1 in 16.

Prepared by boiling for ten minutes, oak bark (bruised) 1 $\frac{1}{4}$ oz., distilled water 1 pint, and making the strained product to measure 1 pint.

Dose—I to 2 oz. (Should not be ordered with iron).

QUININÆ HYDROCHLORAS $C_{20}H_{24}N_2O_2HCl, 2H_2O$

(Hydrochlorate of quinine or quinia) In crystals slightly larger than those of sulphate of quinine, obtained from the same source and by the same process, the separated alkaloid being neutralised by hydrochloric acid.

Dose and action same as the sulphate.

Tinctura Quininæ 160 grs. *hydrochlorate* to 1 pint.

Hydrochlorate of quinine 160 grs. dissolved in 1 pint tincture of orange-peel. Contains 1 gr. in 1 dr.

Dose— $\frac{1}{2}$ to 2 drs.

QUININÆ SULPHAS $((C_{20}H_{24}N_2O_2)_2, H_2SO_4)_2, 15H_2O$

(Sulphate of quinine or quinia). In filiform, silky, snow-white crystals, prepared from various kinds of powdered Cinchona and Remijia barks by extraction with spirit after the addition of lime, or by the action of alkalies on an acidulated aqueous infusion, with subsequent neutralisation of the alkaloid by sulphuric acid, and purification of the resulting salt. It should not contain much more than 5 per cent. of sulphates of other cinchona alkaloids.

Tonic, Antiperiodic, and Antipyretic. Dose—1 to 10 grs.

Tinctura Quininæ Ammoniata 160 grs. to 1 pint.

A colourless liquid, prepared by dissolving sulphate of quinine 160 grs. in solution of ammonia $2\frac{1}{2}$ oz. and proof spirit $17\frac{1}{2}$ oz. Contains 1 gr. *sulphate* in 1 dr.

Dose— $\frac{1}{2}$ to 2 drs., freely diluted.

Vinum Quininæ 1 gr. in 1 oz.

A golden, sherry-coloured liquid, prepared by dissolving sulphate of quinine 20 grs. in orange wine 1 pint, to which citric acid 30 grs. have been added.

Dose— $\frac{1}{2}$ to 1 oz.

Ferri et Quininæ Citras 6 grs. contain 1 gr. quinine.
(See under Ferrum, page 248).

RESINA (Resin)—From Coniferæ.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (turpentine) of various species of Pinus, in translucent, yellowish, brittle, shining masses.

Used chiefly for its adhesive qualities in 9 plasters; it also enters into Ungt. Resinæ, Ungt. Tereb., and Charta Epispastica.

Emplastrum Resinæ 1 in $9\frac{1}{2}$.

(Synonym—Adhesive Plaster). A pale-yellow solid, prepared by melting together resin 4 oz., lead plaster 32 oz., and curd soap 2 oz.

It enters into 3 plasters.

Unguentum Resinæ 1 in 4 nearly.

A yellowish-brown, stiff ointment, prepared by melting together resin 8 oz., yellow wax 4 oz., simple ointment 16 oz., and almond oil 2 oz. Often called Basilicon ointment.

A good stimulating application to indolent ulcers.

RHAMNI FRANGULÆ CORTEX (Frangula Bark)—
Rhamnaceæ. (Synonym—Cortex Frangulæ).

fruit The dried bark, collected at least one year before use, from the young trunks and branches of Rhamnus Frangula, about $\frac{1}{25}$ inch thick, in small quills, and covered with a brown, corky layer marked with white lenticels.

Laxative and Cathartic.

Extractum Rhamni Frangulæ (Synonym—Extractum Frangulæ).

A semi-solid extract, prepared by evaporating a tincture of frangula bark.

Dose—15 to 60 grs.

Extractum Rhamni Frangulæ Liquidum 1 in 1.

A dark liquid, prepared by evaporating a decoction of 1 lb. frangula bark to 12 oz. and adding 4 oz. rectified spirit.

Dose—1 to 4 drs.

RHAMNI PURSHIANI CORTEX (Sacred Bark)—
Rhamnaceæ. (Synonym—Cascara Sagrada).

The dried bark of Rhamnus Purshianus, about $\frac{1}{8}$ inch to $\frac{1}{4}$ inch thick, in quills, covered with a greyish-white, easily removable layer, and spotted with lichens.

Cathartic and Stimulant to the entire intestinal glandular apparatus. The remedy for *habitual* constipation.

Extractum Cascaræ Sagradæ (Synonym—Extractum Rhamni Purshiani).

A semi-solid extract, prepared by exhausting cascara sagrada by percolating with proof spirit and water, and evaporating the resulting liquid.

Dose—2 to 8 grs., in pill.

Extractum Cascaræ Sagradæ Liquidum

(Synonym—Extractum Rhamni Purshiani Liquidum).—An almost black liquid, prepared by boiling 1 lb. of cascara sagrada in distilled water q.s., evaporating the decoction to 12 oz., and adding 4 oz. rectified spirit.

Cathartic, Tonic, and Cholagogue. Dose— $\frac{1}{2}$ to 2 drs.

RHEI RADIX (Rhubarb Root)—Polygonaceæ.

The root, deprived of its bark, sliced and dried, of Rheum palmatum and R. officinale, and probably other species, from China and Thibet. In hard, compact, yellow, irregularly rounded pieces bored with a hole, with a marbled fracture exhibiting starlike spots; odour peculiar and aromatic.

Stomachic, Tonic, and Cathartic.

Dose—5 to 20 grs; 3 grs. for a child 1 year old.

Extractum Rhei

A brown elastic extract, prepared by exhausting rhubarb root with proof spirit and water, and evaporating on a water-bath the tincture so produced.

Dose—5 to 15 grs.

Infusum Rhei $\frac{1}{4}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

$\frac{1}{4}$ oz. rhubarb root sliced infused in 10 oz. boiling water.

Dose—I to 2 oz.

Pilula Rhei Composita 1 in 4 nearly.

Prepared by beating together rhubarb root 3 oz., Socotrine aloes $2\frac{1}{4}$ oz., myrrh and hard soap of each $1\frac{1}{2}$ oz., oil of peppermint $1\frac{1}{2}$ drs., glycerine 1 oz., treacle 3 oz.

Dose—5 to 10 grs.

Pulvis Rhei Compositus 1 in $4\frac{1}{2}$.

(Synonym—Gregory's Powder). A pale-yellow powder, turning red when moistened, prepared by rubbing together rhubarb root 2 oz., light or heavy magnesia 6 oz., ginger 1 oz.

Antacid, Stomachic, and Cathartic.

Dose—20 to 60 grs., in milk; for a child 1 year old, 5 grs.

Syrupus Rhei 1 in 15.

A brown thick liquid, prepared by exhausting 2 oz. each rhubarb root and coriander fruit with distilled water 24 oz. and rectified spirit 8 oz., evaporating to 14 oz., adding 24 oz. sugar, and dissolving with gentle heat.

Dose—I to 4 drs.; $\frac{1}{2}$ dr. for a child 1 year old.

Tinctura Rhei 2 oz. to 1 pint.

A dark-brown liquid, prepared by macerating and percolating with proof spirit 1 pint, rhubarb root 2 oz., cardamoms freed from their pericarps, coriander, and saffron of each $\frac{1}{4}$ oz.

Dose—I to 2 drs. as a Stomachic; $\frac{1}{2}$ to 1 oz. as a Purgative.

Vinum Rhei $1\frac{1}{2}$ oz. to 1 pint.

A brown liquid, prepared by *macerating* for 7 days rhubarb root $1\frac{1}{2}$ oz. and canella bark 60 grs. in sherry 1 pint.

Dose—I to 2 drs.

RHŒADOS PETALA (Red Poppy Petals)—Papaveraceæ.

The fresh, scarlet-coloured petals of Papaver Rhœas, from indigenous plants; used as a colouring agent.

Syrupus Rhœados 1 in $3\frac{1}{2}$.

A rich red syrup, prepared by making an infusion of 13 oz. fresh red poppy petals with distilled water 1 pint, on a water-bath; and in this dissolving sugar $2\frac{1}{4}$ lb., and adding rectified spirit $2\frac{1}{2}$ oz.

Dose 1 dr. (Used to colour mixtures).

RICINI OLEUM (Castor Oil)—From Euphorbiaceæ.

The viscid, almost odourless and colourless oil expressed from the seeds of *Ricinus communis*.

Cathartic. Dose—1 dr. to 1 oz. For a child 1 year old 1 dr.

Enters into Collodium Flexile, Linimentum Sinapis Co., and Pil. Hydrarg. Subchlor. Co., and

Mistura Olei Ricini 6 drs. in 2 oz.

Prepared by mixing gradually together 6 drs. castor oil, 10 mins. oil of lemon, 2 mins. oil of cloves, $1\frac{1}{4}$ drs. syrup, 1 dr. solution of potash and orange flower water to 2 oz.

Cathartic. Dose— $\frac{1}{2}$ to 2 oz.

ROSÆ CANINÆ FRUCTUS (Hips)—Rosaceæ.

The shining, ovate, scarlet, ripe fruit of the Dog-rose, *Rosa canina*, and other indigenous allied species.

Feebly Astringent ; chiefly used as a vehicle.

Confectio Rosæ Caninæ 1 in 3. (Confection of Hips).

A soft brownish mass, prepared by beating to a pulp 1 lb. of seedless hips, sifting, and adding twice their weight of sugar.

$\frac{1}{2}$ to 4 drs. may be taken for a dose.

ROSÆ CENTIFOLIÆ PETALA (Cabbage-Rose Petals)—Rosaceæ.

The fresh, fully-expanded, large and very fragrant petals of the *Rosa centifolia*. From plants cultivated in Britain.

Though slightly Laxative, it is introduced for its odour.

Aqua Rosæ 10 lbs. to 1 gallon, or 1 in 1.

The colourless fragrant water distilled from the fresh petals of the cabbage-rose—10 lbs. (or an equivalent of the dried petals preserved with salt) mixed with water 5 gallons, from which is to be distilled 1 gallon.

A vehicle for medicines, and basis for lotions, &c.

Enters into Mist. Ferri Co. and Trochisci Bismuthi.

ROSÆ GALLICÆ PETALA (Red-Rose Petals)—Rosaceæ.

The purplish-red, unexpanded, velvety petals, fresh and dried of *Rosa gallica*. From plants cultivated in Britain.

Astringent ; chiefly used on account of their colouring.

Confectio Rosæ Gallicæ 1 in 4. (Confection of Roses).

A soft, violet-coloured mass, prepared by beating *fresh* red-rose petals 1 lb. with sugar 3 lbs.

Used as a basis for pill masses.

It enters into 4 pills bearing the name of Aloes, into Carbonate of Iron pill, Blue pill, and Lead and Opium pill.

Infusum Rosæ Acidum $\frac{1}{4}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

A bright red liquid, prepared by infusing *dried* red-rose petals $\frac{1}{4}$ oz. in boiling distilled water 10 oz. and diluted sulphuric acid 1 dr.

Astringent. Dose—I to 2 oz.

Syrupus Rosæ Gallicæ 1 in 17.

A red syrup, prepared from 2 oz. *dried* red rose petals by making an infusion with 1 pint boiling distilled water (for 2 hours), squeezing through calico, heating to the boiling point, filtering, adding 30 oz. sugar, and dissolving with gentle heat.

Dose—I dr. Chiefly used for its bright red colour.

ROSMARINI OLEUM (Oil of Rosemary)—From Labiatae.

The colourless or pale-yellow oil distilled from the flowering tops of *Rosmarinus officinalis*.

Stimulant and Rubefacient. Dose—I to 4 minims.

It enters into Liniment. Saponis and Tr. Lavand. Co., and the following—

Spiritus Rosmarini 1 in 50.

A colourless liquid, consisting of oil of rosemary 1 oz., dissolved in 49 oz. rectified spirit.

Dose— $\frac{1}{2}$ to 1 dr., diluted.

RUTÆ OLEUM (Oil of Rue)—From Rutaceae.

The pale-yellow oil distilled from the fresh herb of *Ruta graveolens*.

Emmenagogue and Rubefacient. Dose—I to 4 mins.

SABADILLA (Cevadilla)—Melanthaceae.

The dried, scimitar-shaped, wrinkled, dark-brown shining seeds of *Schoenocaulon officinale* (*Asagrea officinalis*), *without* their pericarps. Used only to make Veratrine.

SABINÆ CACUMINA (Savin Tops)—Coniferae.

The fresh and dried tops of *Juniperus Sabina*. Twigs covered with minute imbricated leaves in 4 rows. Collected in spring from British plants.

Emmenagogue. Dose—4 to 10 grs., in powder.

Oleum Sabinæ

The colourless or pale-yellow oil distilled in Britain from fresh savin tops.

Dose—I to 4 minims, on sugar or in emulsion.

Tinctura Sabinæ $2\frac{1}{2}$ oz. to 1 pint.

A brownish liquid, prepared by macerating and percolating dried savin tops $2\frac{1}{2}$ oz. with proof spirit 1 pint.

Dose—20 minims to 1 dr.

Unguentum Sabinæ 8 to 19.

A green ointment, prepared by digesting fresh savin tops 8 oz. in a melted mixture of yellow wax 3 oz. and benzoated lard 16 oz. on a water-bath, and expressing through calico.

Used to keep blistered surfaces from healing.

SACCHARUM LACTIS (Sugar of Milk) $C_{12}H_{24}O_{12}$

In white cylindrical masses or fragments of cakes, obtained from the whey of milk by evaporation.

Diuretic, and Sedative to the stomach, but generally used to dilute powders, as in Pulvis Elaterini Co. and Euonymin.

Dose—1 to 4 drs. or more, in water or milk.

SACCHARUM PURIFICATUM $C_{12}H_{22}O_{11}$

(Refined Sugar) (Synonym—Sucrose). In compact crystalline conical loaves. Used for its sweetening properties.

It enters into all the syrups and lozenges, most of the confections, some mixtures, pills, and powders, into Ferri Carb. Saccharata, Liq. Calcis Sac., Ext. Sarsæ Liq., Sodii Citro-Tart. Effervescens, and Mag. Sulph. Effervescens.

Syrupus 5 lbs. to $2\frac{1}{2}$ lbs., or 1 in $1\frac{1}{8}$.

A thick colourless liquid, prepared by dissolving sugar 5 lbs. in distilled water $2\frac{1}{2}$ lbs. Its specific gravity is 1.330, which is about the average density of the syrups.

It enters into chalk, castor oil, and creasote mixtures, pill of gamboge, 3 syrups, 2 confections, and Tr. Chlorof. et Morphinæ.

SALICINUM (Salicin) $C_{13}H_{18}O_7$ —Salicaceæ.

A crystalline glucoside, in small, shining, colourless crystals, obtained by treating the bark of *Salix alba* and other species of *Salix* and of various species of *Populus* with hot water, removing tannin and colour from the decoction, evaporating, purifying, and recrystallising.

Acts like Sodii Salicylas. Dose—3 to 20 grs.

SAMBUCI FLORES (Elder Flowers)—Caprifoliaceæ.

The small white *fresh* flowers in corymbose cymes of *Sambucus nigra*, from indigenous plants.

Seldom employed, except as a Cosmetic to remove freckles.

Aqua Sambuci 1 in 1 (same strength as Aq. Rosæ).

A colourless water, prepared by mixing fresh elder flowers 10 lbs. with water 5 gallons, and distilling 1 gallon. May be made with an equivalent quantity of the preserved flowers.

A fragrant basis for skin lotions.

SANTALI OLEUM (Oil of Sandal Wood)—Santalaceæ.

(Synonym—Oleum Santali Flavi). The thick, pale-yellow aromatic oil distilled from the wood of *Santalum album*.

Diuretic ; like *Copaiba*. Dose—10 to 30 minims.

SANTONICA (Santonica)—Compositæ.

The pale, greenish-brown, smooth, minute, unexpanded flower-heads of *Artemisia maritima*, *var. Stechmanniana* (*Artemisia pauciflora*).

Anthelmintic. Dose—10 to 60 grs.

SANTONINUM (Santonin) $C_{15}H_{18}O_3$

The active principle of santonica; in minute, colourless, flat, and rhombic prisms, becoming yellow on exposure to light. Prepared by a process of which the following is an outline:—

Santonica is boiled with slaked lime and water, which forms a solution of santionate of lime. This liquid is concentrated by evaporation, and hydrochloric acid is added to precipitate the santonin. The precipitate, after washing with water and ammonia, is dissolved in boiling spirit, to which charcoal is added; from the solution crystals are deposited, these are purified by recrystallisation.

Anthelmintic—killing the round and thread worm.

Dose—For an adult, 2 to 6 grs.; for a child 1 year, $\frac{1}{2}$ to $\frac{3}{4}$ gr.; for a child 2 or 3 years old, 2 grs.; and above 4 years, 3 grs.

It should, if possible, always be given in a teaspoonful of castor oil, which greatly increases its efficacy and safety.

Trochisci Santonini (1 gr. in each).

White or yellowish-white lozenges, composed of Santonin, sugar, gum acacia, mucilage of acacia and water.

SAPO ANIMALIS (Curd Soap).

The white or greyish-white, horny, and nearly inodorous brittle soap made with soda and a purified animal fat, consisting principally of stearin.

Mildly Laxative, but chiefly used for its physical qualities.

IN—Emp. Resinæ, Saponis, and Saponis Fuscum, Ext. Col. Co., Lin. Pot. Iod. C. Sapone, Pil. Scammonii Co., Pil. Phosph., and Suppositoria Acid. Tannic., Carbolic., and Morphinæ cum Sapone.

Emplastrum Saponis 1 of soap in 7.

A white solid, prepared by melting curd soap 6 oz., resin 1 oz., and lead plaster $2\frac{1}{4}$ lbs., stirring and evaporating.

A useful Strapping for swollen joints; acts mechanically.

Enters into Empl. Calefaciens, and Empl. Balladonnæ.

Emplastrum Saponis Fuscum (Brown Soap Plaster) 1 in 6.

(Synonym—Emplastrum Cerati Saponis). A brownish solid, prepared by heating oxide of lead 15 oz. with vinegar 1 gallon till the oxide combines with the acid, then adding curd soap 10 oz., heating again till the moisture is evaporated, adding yellow wax $12\frac{1}{2}$ oz. and olive oil 20 oz., and evaporating to a proper consistence. It contains oleate of lead.

Sapo Durus (Hard Soap) (Synonym—White Castile Soap).

The dry, greyish-white soap, in appearance resembling curd soap, but made with olive oil and soda. It is an oleate of soda.

Antacid and Laxative. Dose—5 to 15 grs., in pill.

Enters into 7 pill masses, and

Linimentum Saponis 1 in 12.

A clear, straw-coloured liquid, prepared by macerating for 7 days hard soap 2 oz., camphor 1 oz., and oil of rosemary 3 drs., in rectified spirit 16 oz., diluted with distilled water 4 oz.

A Stimulating application to bruises and sprains; sometimes called "Opodeldoc."

Enters into Linimentum Opii.

Pilula Saponis Composita 1 gr. opium in 6.

(Synonym—Pilula Opii). Prepared by beating together powdered opium $\frac{1}{2}$ oz. hard soap 2 oz., glycerine q.s.

Narcotic. The name Pil. Saponis Co. is used to disguise its composition. Dose—3 to 5 grs.

Sapo Mollis (Soft Soap).

The yellowish-green inodorous jelly, made with olive oil and potash, being an oleate of potassium.

Used in making turpentine liniment.

SARSÆ RADIX (Jamaica Sarsaparilla)—Smilacæ.

The dried, long, slender, reddish-brown root, covered with rootlets, of *Smilax officinalis*, formerly imported from Central America by way of Jamaica.

An Alterative and Diaphoretic. Dose— $\frac{1}{2}$ to 2 drs., in powder.

Decoctum Sarsæ $2\frac{1}{2}$ oz. to 1 pint.

Prepared by digesting sarsaparilla root $2\frac{1}{2}$ oz. in boiling distilled water $1\frac{1}{2}$ pints for 1 hour, then boiling for 10 minutes, and making the strained product measure 1 pint.

Dose—2 to 10 oz.

Decoctum Sarsæ Compositum $2\frac{1}{2}$ oz. to 1 pint.

Prepared by digesting for 1 hour in $1\frac{1}{2}$ pints boiling distilled water, sarsaparilla root $2\frac{1}{2}$ oz., sassafras, guaiacum, dried liquorice of each $\frac{1}{4}$ oz., mezereon bark, $\frac{1}{8}$ oz., boiling for 10 minutes, and making the strained product measure 1 pint.

Dose—2 to 10 oz.

Extractum Sarsæ Liquidum 1 in 1.

(Synonym — Liquor Sarsæ). A deep coffee-brown liquid, prepared by exhausting 40 oz. sarsaparilla with 40 oz. proof spirit and pressing out 20 oz., macerating the marc at 160° ,

with 12 pints water, straining, adding 5 oz. sugar, evaporating and adding the 20 oz. spirituous extract, so that the product measures 40 oz.

Dose—2 to 4 drs.

SASSAFRAS RADIX (Sassafras Root)—*Lauraceæ*.

The dried, brown root of *Sassafras officinale*, in pieces covered with rusty brown bark, also in chips or shavings.

Diaphoretic. Used only to flavour Decoctum Sarsæ Co.

SCAMMONIÆ RADIX (Scammony Root)—*Convolvulaceæ*.

The dried, hard, tap-shaped roots, brown without, white within, of *Convolvulus Scammonia*.

A griping Cathartic.

Only used for making the following :—

Scammoniæ Resina (Resin of Scammony).

The brownish, translucent, brittle, resinous solid, prepared by exhausting scammony root with rectified spirit, adding water (which throws down the resin), and then distilling off the spirit and washing and drying the residue. It may be similarly prepared from scammony.

Dose—3 to 8 grs., in pill or powder, or rubbed up with milk.

It enters into Pil. and Extract. Colocynth. Co. and the following :—

Confectio Scammonii I in 3.

A brown, soft mass, prepared by mixing scammony resin 6 oz., ginger 3 oz., (both in fine powder), oil of caraway 2 drs., oil of cloves 1 dr., syrup 6 oz., and honey 3 oz.

Dose—10 to 30 grs.

Pilula Scammonii Composita I in 3 nearly.

Prepared by dissolving resins of scammony and jalap of each 1 oz., curd soap 1 oz., in strong tincture of ginger 1 oz., and rectified spirit 2 oz., and evaporating to a proper consistence.

Cathartic. Dose—5 to 15 grs.

Pulvis Scammonii Compositus I in 2.

A brown powder, prepared by mixing and sifting scammony resin 4 oz., jalap 3 oz., and ginger 1 oz.

An active Hydragogue Cathartic.

Dose—10 to 20 grs. I to 2 grs. for a child 1 year old.

SCAMMONIUM (Scammony).

A gum resin, obtained by incising the *living* root of *Convolvulus Scammonia*, in ash-grey and rough, *cinder-like* irregular fragments, with a black, shining, splintery, resinous fracture.

A powerful Cathartic. Dose—5 to 10 grs.

Mistura Scammonii 3 grs. to 1 oz.

An emulsion of 6 grs. scammony and 2 oz. milk.

Dose—1 to 3 oz. For a child 1 year old, 1 to 2 drs.

SCILLA (Squill)—Liliaceæ.

The dried, sliced, pear-shaped bulb or underground stem of *Urginea Scilla*, divested of its outer scales; in dried, yellowish-white, tough, curved, dampish fragments or slices.

Diuretic and Expectorant. Dose—1 to 3 grs.

Acetum Scillæ 2½ oz. to 1 pint nearly.

A pale straw-coloured liquid, prepared by macerating squill 2½ oz. in dilute acetic acid 1 pint for 7 days.

Dose—15 to 40 minims; generally given as *Syr. Scillæ*.

Oxymel Scillæ

A thick, opalescent, brownish liquid, composed of vinegar of squill 1 pint, clarified honey 2 lbs., mixed and evaporated till the density of 1.32 is reached.

Dose—½ to 1 dr. as an Expectorant.

Pilula Scillæ Composita 1 in 5.

Prepared by mixing and beating into a uniform mass squill 1¼ oz., ginger, ammoniacum, and hard soap, of each (in fine powder) 1 oz., treacle by weight 2 oz. or q.s.

Dose—5 to 10 grs., as an Expectorant or Diuretic.

Syrupus Scillæ 1 of squill in 17.

A thick, straw-coloured liquid, prepared by dissolving sugar 2½ lb. in vinegar of squill 1 pint.

Dose—½ to 1 dr. as an Expectorant; 1 oz. as an Emetic.

For a child 1 year old, 5 mins.; as an Emetic, ½ to 1 dr.

As it contains acetic acid, it should not be ordered with alkalies. It is sometimes ordered by mistake with *Spt. Ammon. Aromat.*

Tinctura Scillæ 2½ oz. to 1 pint.

A straw-coloured liquid, prepared by macerating and percolating bruised squill 2½ oz. with proof spirit 1 pint.

Dose—10 to 30 minims.

Pilula Ipecacuanhæ cum Scilla (*Vide Ipecacuanha*).

It contains 1 part of opium, 1 of ipecacuanha, 3¼ of squill, and 3¼ of ammoniacum in 23½ parts.

SCOPARII CACUMINA (Broom Tops)—Leguminosæ.

The fresh and dried tops, with their straight, angular, dark green, smooth twigs, of *Cytisus scoparius* (*Sarothamnus scoparius*), from indigenous plants.

Diuretic; in large dose, Cathartic.

Decoctum Scoparii 1 oz. (*dried*) to 1 pint.

Prepared by boiling for 10 minutes dried broom tops 1 oz. in water 1 pint, and making the strained product measure 1 pint.

Dose—2 to 4 oz.

Succus Scoparii

The brown juice obtained by bruising fresh broom tops in a stone mortar, and adding to every 3 measures of the fresh juice 1 measure of rectified spirit, setting aside and filtering.

Dose—1 to 2 drs.

SENEGÆ RADIX (Senega Root)—Polygalaceæ.

The dried, yellowish-brown, contorted root of *Polygala Senega*, from $\frac{1}{5}$ to $\frac{1}{3}$ inch in thickness, with a keel along its whole extent. (See under Valerian).

Infusum Senegæ $\frac{1}{2}$ oz. to $\frac{1}{2}$ pint ($\frac{1}{2}$ hour).

Prepared by infusing senega root in No. 20 powder $\frac{1}{2}$ oz., in boiling distilled water $\frac{1}{2}$ pint.

Dose— $\frac{1}{2}$ to 2 oz. Used as a basis for cough mixtures.

Tinctura Senegæ $2\frac{1}{2}$ oz. to 1 pint.

A brown, sherry-coloured liquid, prepared by macerating and percolating senega root $2\frac{1}{2}$ oz. in No. 40 powder with proof spirit 1 pint.

Dose— $\frac{1}{2}$ to 2 drs.

SENNA ALEXANDRINA (Alexandrian Senna)—Leguminosæ.

The greyish-green, lanceolate, acute leaflets, about one inch long, and unequally divided at the bases, of *Cassia acutifolia* (*Cassia lanceolata*), from Alexandria. They should be carefully freed from Argel leaves, which are bitter, and have not an unequal oblique base.

Cathartic. Dose—10 to 30 grs.

SENNA INDICA (East Indian Senna)—Leguminosæ.

(Synonym—Tinnivelly Senna). The green, lanceolate, acute leaflets of *Cassia angustifolia* (*Cassia elongata*), from one to two inches long, with an unequal and oblique base. From Southern India, and imported pure.

May be used instead of Alexandrian senna (which it resembles in dose and action), to make any of the following preparations:—

Confectio Sennæ 1 in 11.

A soft blackish mass, composed of powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz., tamarind 9 oz., cassia pulp 9 oz., prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., distilled water 24 oz. or q.s.; prepared by boiling the figs and prunes in the water, adding the tamarind and cassia, rubbing the pulp

through a sieve, in this dissolving the sugar and extract of liquorice and adding the powders, making the weight up to 75 oz. with distilled water. Called "Lenitive electuary."

Laxative and Cathartic. Dose—I to 2 drs.

Infusum Sennæ 1 oz. to 10 oz. ($\frac{1}{2}$ hour).

Prepared by infusing senna 1 oz. and ginger 28 grs. in boiling distilled water 10 oz.

Dose—I to 2 oz.

Enters into Mist. Sennæ Co.

Mistura Sennæ Composita 1 of MgSO_4 in 5.

(Synonym—Black Draught). An almost black liquid, consisting of sulphate of magnesium 4 oz., liquid extract of liquorice 1 oz., tincture of senna $2\frac{1}{2}$ oz., compound tincture of cardamoms $1\frac{1}{2}$ oz., infusion of senna 15 oz.

Hydragogue Cathartic. Dose—I to $1\frac{1}{2}$ oz.

Syrupus Sennæ 1 in 2.

A deep brownish-black liquid, prepared by making an infusion of 1 lb. of senna with 5 pints of distilled water at 120° , evaporating to 10 oz., adding 3 oz. rectified spirit in which are dissolved 3 minims oil of coriander; filtering, making the product measure 16 oz. by the addition of distilled water, and in this dissolving 24 oz. sugar.

A mild Cathartic.

Dose—I to 4 drs.; a child 1 year old may get $\frac{1}{2}$ to 1 dr.

Tinctura Sennæ $2\frac{1}{2}$ oz. to 1 pint.

A dark liquid, prepared by macerating and percolating with 1 pint of proof spirit the following:—Senna $2\frac{1}{2}$ oz., raisins freed from seeds 2 oz., caraway and coriander of each $\frac{1}{2}$ oz.

Dose—I to 4 drs.

Enters into Mist. Sennæ Co.

Pulvis Glycyrrhizæ Compositus 1 of senna in 6. (See Glycyrrhiza).

SERPENTARIÆ RHIZOMA (Serpentary Rhizome)—
Aristolochiaceæ. (Synonym—Serpentariæ Radix).

The small, round, knotty, yellowish-white, dried rhizome, with numerous slender rootlets, of Aristolochia Serpentaria or of A. reticulata. The rhizome of the latter is a little thicker and the rootlets larger and less matted. (See under Valerian).

Diaphoretic. Dose—10 to 15 grs.

It enters into Tinct. Cinchonæ Co., and the following:—

Infusum Serpentariæ $\frac{1}{4}$ oz. to 10 oz. ($\frac{1}{2}$ hour).

Prepared by infusing serpentary rhizome $\frac{1}{4}$ oz. in boiling distilled water 10 oz.

Dose—I to 2 oz.

Tinctura Serpentariæ 2½ oz. to 1 pint.

A brown liquid, prepared by macerating and percolating serpentary in No. 40 powder 2½ oz. with proof spirit 1 pint.

Dose—½ to 2 drs.

SEVUM PRÆPARATUM (Prepared Suet).

The white, smooth, internal fat of the abdomen of the sheep—*Ovis Aries*—purified by melting and straining.

Used to give proper consistence to Empl. *Cantharidis* and Ungt. Hydrarg.

SINAPIS (Mustard)—*Cruciferae*.

Black and white mustard seeds, powdered and mixed, forming a greenish-yellow acrid powder.

Emetic and Stimulant. Externally—Rubefacient.

Sinapis Albæ Semina (White Mustard Seeds).

The hard, round, pale-yellow, finely pitted, dried, ripe seeds (1 line in diameter) of *Brassica alba* (*Sinapis alba*) from British plants.

Sinapis Nigræ Semina (Black Mustard Seeds).

The dark-reddish, round, hard, dried, ripe seeds (½ a line in diameter) of *Brassica nigra* (*Sinapis nigra*) from British plants.

Cataplasma Sinapis 2½ oz. in 15 oz.

Composed of linseed meal 2½ oz., mixed gradually with boiling water 8 oz., to which is added mustard 2½ oz. previously mixed with 2 oz. lukewarm water.

Charta Sinapis 1 in 3.

Prepared by mixing mustard 1 oz. with solution of gutta percha 2 oz., and coating over with the semi-fluid mixture one surface of strips of cartridge paper. Before being applied, they should be dipped for a few seconds into tepid water.

Counter-irritant and Rubefacient.

Oleum Sinapis

The pale-yellow pungent oil distilled with water from the seeds of *Black* mustard after the expression of the fixed oil.
It sinks in water.

A powerful Irritant, producing instant Vesication.

Linimentum Sinapis Compositum 1 in 40.

A deep-green liquid, prepared by adding oil of mustard 1 dr. to castor oil 5 drs., and adding the mixture to ethereal extract of mezereon 40 grs. and camphor 120 grs., dissolved in rectified spirit 4 oz.

A Stimulating and Rubefacient application.

SODA CAUSTICA (Caustic Soda) NaHO

(Synonym—Sodæ Hydras). Hydrate of Sodium with some impurities. In hard greyish-white fragments or sticks, prepared by rapidly boiling down solution of soda in a silver or clean iron vessel until an oily fluid consistence is reached, when it is poured out or run into moulds, and preserved in stoppered green glass bottles.

Powerfully Corrosive and Alkaline.

It is contained in the following :—

Liquor Sodæ 18·8 grs. in 1 oz.

A colourless liquid, prepared by boiling carbonate of sodium 28 oz. with distilled water 1 gallon, and gradually adding slaked lime 12 oz., and continuing the ebullition 10 minutes, carbonate of lime falls, and the caustic soda remains in solution.

Antacid—in 20 minim doses. Seldom given internally.

Soda Tartarata (Tartarated Soda) $\text{NaKC}_4\text{H}_4\text{O}_6, 4\text{H}_2\text{O}$

(Synonyms—Sodæ et Potassæ Tartras; Sodæ Potassio-tartras; Tartrate of Potassium and Sodium; Rochelle Salt). Colourless transparent prisms, soluble in 2 parts water; prepared by adding cream of tartar to a hot strong solution of carbonate of sodium, boiling, filtering, concentrating, and crystallising.

A Hydragogue Cathartic.

Dose— $\frac{1}{4}$ to $\frac{1}{2}$ oz. Lemonade makes an agreeable vehicle.

Pulvis Sodæ Tartaratæ Effervescens (Effervescent Tartarated Soda or Seidlitz Powder).

Consists of 120 grs. tartarated soda and 40 grs. bicarbonate of soda, in a blue paper, dissolved in nearly half a pint of cold or warm water, to be taken in effervescence with 38 grs. tartaric acid, in a white paper.

Sodii Arsenias $\text{Na}_2\text{HAsO}_4, 7\text{H}_2\text{O}$, and $\text{Na}_2\text{HAsO}_4, 12\text{H}_2\text{O}$

Colourless transparent prisms, soluble in twice their weight of water, prepared by fusing together arsenious acid, nitrate of sodium, and dried carbonate of sodium, dissolving the fused product in boiling water, and crystallising.

Alterative and Tonic. Dose— $\frac{1}{16}$ to $\frac{1}{8}$ gr.

Liquor Sodii Arseniatis 4·5 grs. in 1 oz., or 1 in 100.

A colourless solution of arseniate of sodium (rendered anhydrous by a heat under 300°) $4\frac{1}{2}$ grs. in distilled water 1 oz.

Dose—5 to 10 minims, diluted, after meals.

Sodii Benzoas $\text{NaC}_7\text{H}_5\text{O}_2$

A white powder, inodorous or having a faint benzoic odour, obtained by neutralising benzoic acid with solution of carbonate of soda, and evaporating.

Diuretic. Dose—10 to 30 grs.

Sodii Bicarbonas NaHCO_3

In white powder, or small, irregular, opaque, white scales, soluble in 10 times their weight of water, prepared by saturating carbonate of sodium with carbonic acid; or by the reaction of chloride of sodium and bicarbonate of ammonium. Often called "Baking Soda."

Antacid; Dose—10 to 60 grs., in solution; 24 grs. make an effervescing draught with $\frac{1}{2}$ oz. lemon juice. (See Citric Acid.)

Enters into Sodii Citro-Tart. Efferves., Sodii Tart. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., and the following:—

Liquor Sodæ Effervescens 30 grs. to 1 pint.

(Synonyms—Aqua Sodæ Effervescens; Soda Water). Prepared by passing pure washed carbonic acid under a pressure of 4 atmospheres into a solution of bicarbonate of sodium 30 grs. in water 1 pint, corking and tying over.

Trochisci Sodii Bicarbonatis 5 grs. in each.

White lozenges, composed of bicarbonate of sodium, sugar, gum acacia, mucilage of gum acacia, and distilled water.

Dose—1 to 6 lozenges.

Sodii Bromidum NaBr

A granular white powder, consisting of monoclinic crystals, obtained by adding bromine to soda solution till a permanent brown tint remains, evaporating to dryness, fusing with charcoal, dissolving out the bromide of sodium, and crystallising from warm solutions.

Antispasmodic. Sedative like KBr. Dose—10 to 30 grs.

Sodii Carbonas $\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$

In large, transparent, colourless, rhombic crystals, soluble in twice their weight of water, obtained from chloride of sodium, either by reaction with bicarbonate of ammonium and ignition, or by conversion into sulphate, and adding carbon and carbonate of calcium and heating. It is known as "Washing Soda."

Antacid. 20 grs. neutralise about 9.8 of citric acid.

Dose—5 to 30 grs., in solution.

From it all of the sodium salts can be artificially obtained.

Sodii Carbonas Exsiccata Na_2CO_3

A white powder, obtained by strongly heating carbonate of sodium and reducing the residue to powder. It only differs from the crystallised carbonate in being devoid of water of crystallisation, and is nearly three times stronger (3 grs.=8 grs.).

Dose—3 to 10 grs., in pill or powder.

Sodæ Chlorinatæ Liquor $2\frac{1}{2}$ per cent. Cl.

A colourless solution, prepared by dissolving $1\frac{1}{2}$ lbs. carbonate

of sodium in 40 oz. water, and adding 1 lb. chlorinated lime mixed with 6 pints water, and filtering.

Antiseptic and Disinfectant. Dose—10 to 20 minims, diluted. As a gargle, $\frac{1}{2}$ dr. to 1 oz.; as a lotion, 1 dr. to 1 oz.

Cataplasma Sodæ Chlorinatæ 2 in 14.

Prepared by gradually mixing linseed meal 4 oz. with boiling water 8 oz., and adding solution of chlorinated soda 2 oz.

A Disinfecting and Deodorising application to foul wounds.

Sodii Chloridum (Common Salt) **NaCl**

In small crystalline grains, or in transparent cubical crystals generally obtained from the native rock salt.

Purgative, Emetic, and Anthelmintic. Dose— $\frac{1}{2}$ to 1 oz.

Used in making Hydrochloric Acid, Calomel, and Corrosive Sublimate.

Sodii Citro-Tartras Effervescens

A mechanical mixture of bicarbonate of sodium 17 oz., tartaric acid 9 oz., citric acid 6 oz., sugar 5 oz., all in powder, heated between 200° and 220° until the particles begin to aggregate, and then assiduously stirred till they become granulated.

Dose—1 to 2 drs. as a Refrigerant and Laxative.

Sodii Ethylatis Liquor (19 per cent. **NaC₂H₅O**).

A colourless or brownish syrupy liquid, prepared by dissolving 22 grs. pure metallic sodium in 1 oz. absolute alcohol.

Caustic; painted over nævoid and cancerous growths.

Sodii Hypophosphis **NaPH₂O₂**.

A white granular salt, soluble in twice its weight of water, obtained by adding carbonate of sodium to a solution of hypophosphite of calcium, filtering, and evaporating to dryness on a steam-bath, with constant stirring.

Nervine Tonic and Restorative. Dose—5 to 10 grs.

Sodii Iodidum **NaI**

A white crystalline powder, prepared like iodide of potassium by using soda instead of potash solution.

Alterative; like KI. Dose—3 to 10 grs.

Sodii Nitras **NaNO₃**

A native salt, in colourless, obtuse rhomboids.

Used in the preparation of Arseniate of Sodium, and Nitric Acid.

Sodii Nitris **NaNO₂**

A whitish, deliquescent, crystalline salt, very soluble in water. Acts like Amyl Nitrite. Dose—2 to 5 grs.

Sodii Phosphas **Na₂HPO₄.12H₂O**

In large, transparent, colourless, rhombic prisms, soluble in times their weight of water, prepared by dissolving bone-ash

($\text{Ca}_3\text{P}_2\text{O}_8$) in sulphuric acid, and to the acid phosphate of calcium thus formed adding a solution of carbonate of sodium.

Purgative and Diuretic. $\frac{1}{4}$ to 1 oz.

Used in making Ferri Phosph. and its Syrup, and

Sodii Phosphas Effervescens 1 in 2.

A granular powder prepared by heating 25 oz. phosphate of sodium, and mixing it with 25 oz. bicarbonate of sodium, $13\frac{1}{2}$ oz. tartaric acid, and 9 oz. citric acid, heating between 200° and 220°F ., and stirring assiduously till granulation takes place. The product should weigh 50 oz.

Aperient and Antacid. Dose— $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Sodii Salicylas ($\text{NaC}_7\text{H}_5\text{O}_3$)₂, H_2O

In small, almost colourless, very soluble, crystalline scales, obtained by the action of salicylic acid on carbonate of sodium, or on caustic soda.

Antipyretic and Antirheumatic. Dose—10 to 30 grs.

Sodii Sulphas $\text{Na}_2\text{SO}_4, 10\text{H}_2\text{O}$

(Synonym—Glauber's Salt.) In large, transparent, oblique, efflorescent prisms, soluble in three times their weight of water; may be obtained from the residue left on making hydrochloric acid, by neutralising it with carbonate of sodium, and crystallising from solution in water.

Hydragogue Cathartic. Dose— $\frac{1}{4}$ to 1 oz.

Sodii Sulphas Effervescens 1 in 2.

A granular powder, prepared by heating 25 oz. sulphate of sodium, mixing it with 25 oz. bicarbonate of sodium, $13\frac{1}{2}$ oz. tartaric acid, and 9 oz. citric acid, heating between 200° and 220°F ., and stirring assiduously till granulation takes place. The product should weigh 50 oz.

Aperient and Antacid. Dose— $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Sodii Sulphis $\text{Na}_2\text{SO}_3, 7\text{H}_2\text{O}$

Colourless, transparent, monoclinic, efflorescent prisms, obtained by the action of sulphurous acid on carbonate of sodium or caustic soda.

Antiseptic and Antiparasitic. Dose—5 to 20 grs.

Sodii Sulphocarbolas $\text{NaC}_6\text{H}_5\text{SO}_4, 2\text{H}_2\text{O}$

Colourless transparent rhombic prisms, obtained by dissolving carbolic acid in excess of sulphuric acid, supersaturating the liquid with carbonate of barium, filtering, and treating the filtrate with carbonate of sodium, and evaporating.

Antipyretic and Antiseptic. Dose—10 to 15 grs.

Sodii Valerianas $\text{NaC}_5\text{H}_9\text{O}_2$

In dry, white masses, with strong odour. Prepared by decomposing Amylic alcohol (fousel oil) with sulphuric acid and bichromate of potassium, and saturating the valerianic acid thus formed with soda solution and evaporating.

Antispasmodic in 5 gr. pill ; used in making Zinci Valerianas.

Sodium Na

The soft metallic element sodium, as met with in commerce, introduced into the B.P. to make Liquor Sodii Ethylatis It should be kept in stoppered bottles, under mineral naphtha.

SPIRITUS RECTIFICATUS (Rectified Spirit) $\text{C}_2\text{H}_6\text{O}$

The colourless, transparent, mobile liquid, consisting of alcohol, with 16 per cent. of water, obtained by the distillation of fermented saccharine fluids. S.G., '838.

1 part to 3 of water makes "Spirit Lotion."

SPIRITUS TENUIOR (Proof Spirit) 5 in 8. 49 per cent.

A colourless liquid, consisting of rectified spirit 5 pints and distilled water 3 pints ; its S.G. is '920.

SPIRITUS VINI GALlici (French Brandy).

Being the pale brown liquid, distilled from French wine, and generally containing about 50 per cent. of alcohol.

Mistura Spiritus Vini Gallici

Often known as Egg-flip ; prepared by rubbing the yolks of two eggs with $\frac{1}{2}$ oz. sugar, and adding French brandy and cinnamon water of each 4 oz.

Nutritive, Restorative, and Narcotic. Dose—I to 2 oz.

STAPHISAGRIÆ SEMINA (Stavesacre Seeds)—Ranunculaceæ.

The irregularly triangular, brown, dried, ripe seeds of Delphinium Staphisagria, with wrinkled and pitted testa.

Parasiticide.

Unguentum Staphisagriæ

Prepared by heating 4 oz. crushed stavesacre seeds with 8 oz. benzoated lard on a water-bath for two hours, and straining. Contains 10 per cent. of oil of stavesacre.

Parasiticide, used to destroy pediculi.

STRAMONII FOLIA (Stramonium Leaves)—Solanaceæ.

The dried, dark-green, ovate, petiolate, minutely wrinkled leaves of Datura Stramonium.

Narcotic and Antispasmodic ; chiefly used in Asthma.

Stramonii Semina (Stramonium Seeds)—Solanaceæ.

The small, reniform, pitted and wrinkled, brownish-black, flattened, dried, ripe seeds of *Datura Stramonium*.

Narcotic and Antispasmodic ; chiefly used in Asthma.

Extractum Stramonii

The soft, blackish extract obtained by washing the powdered seeds with ether to extract fixed oil, after which a strong tincture is made, and evaporated to a suitable consistence.

Dose— $\frac{1}{4}$ to $\frac{1}{2}$ gr., in pill.

Tinctura Stramonii $2\frac{1}{2}$ oz. to 1 pint.

A brown liquid, prepared by macerating and percolating stramonium seeds (bruised) $2\frac{1}{2}$ oz. with proof spirit 1 pint.

Dose—10 to 30 minims, diluted.

STROPHANTHUS (Strophanthus)—Loganiaceæ.

The ripe seeds of *Strophanthus hispidus* (Kombé), freed from their awns. $\frac{3}{5}$ inch long and $\frac{1}{6}$ inch broad, greenish-fawn, and covered with silky hairs.

Cardiac Tonic like *Digitalis*.

Tinctura Strophanthi 1 in 20.

Prepared by macerating and percolating 1 oz. dried and powdered strophanthus with sufficient ether to remove all green oily matter. The dried marc is then macerated and percolated with rectified spirit 1 pint.

Dose—2 to 10 minims.

STRYCHNINA (Strychnine)— $C_{21}H_{22}N_2O_2$ —Loganiaceæ.

(Synonym — Strychnia). An alkaloid, in small, square, colourless octahedrons or prisms, prepared from *Nux Vomica* by the following method :—A tincture of *nux vomica* is made with hot spirit and water, and concentrated by evaporation, acetate of lead is added to the concentrated liquid after the spirit is evaporated ; this throws down colouring matter, &c., and forms a solution of strychnine and brucine. After filtration the impure strychnine is precipitated by ammonia, repeatedly washed and redissolved in hot spirit, and the alkaloid crystallises out on cooling.

Spinal Stimulant. Dose— $\frac{1}{30}$ to $\frac{1}{12}$ gr.

Liquor Strychninæ Hydrochloratis 1 in 100.

(Synonym—Liquor Strychniæ). A colourless solution of strychnine 9 grs., dilute hydrochloric acid 14 minims, in rectified spirit $\frac{1}{2}$ oz., and distilled water $1\frac{1}{2}$ oz.

Dose—5 to 10 minims—viz., $\frac{1}{20}$ to $\frac{1}{10}$ gr. of alkaloid.

STYRAX PRÆPARATUS (Prepared Storax).

Liquidambaraceæ. A semi-transparent, brownish, semi-fluid resin or balsam, prepared from the bark of *Liquidambar orientalis*, purified by solution in spirit, filtration, and evaporation.

Expectorant, used in making Tinct. Benzoini Co.

Dose—10 to 20 grs.

SULPHONAL (Sulphonal) $C_7H_{16}S_2O_4$.

(Synonym—Diethylsulphon - dimethyl - methane $(CH_3)_2C(SO_2C_2H_5)_2$). Colourless, inodorous, tasteless, insoluble crystals.

A pure Hypnotic. Dose—15 to 40 grs.

SULPHUR PRÆCIPITATUM (Precipitated Sulphur) **S**

A greyish-yellow soft powder, free from grittiness, prepared by dissolving sublimed sulphur by boiling in water with slaked lime, and then precipitating with hydrochloric acid, washing and drying the precipitate. Known as "Milk of Sulphur."

Laxative. Dose—20 to 60 grs.

Sulphur Sublimatum (Sublimed Sulphur) **S**

A gritty greenish-yellow powder, prepared by sublimation from crude or rough sulphur. Known as "Flowers of Sulphur."

Laxative and Antiparasitic. Dose—20 to 60 grs./

In addition to Emp. Hydrarg., Emp. Ammon. cum Hydrarg., and Pulv. Glycyrrhizæ Co., it enters into the following :—

Confectio Sulphuris 1 in $2\frac{1}{2}$.

A soft yellow paste, prepared by rubbing together sublimed sulphur 4 oz., cream of tartar 1 oz., and syrup of orange peel by measure 4 oz. (or by weight 5 oz.), and tragacanth 18 grs.

Dose—60 to 120 grs.

Trochisci Sulphuris 5 grs. in each.

Lozenges containing precipitated sulphur, cream of tartar, sugar, gum, mucilage, and tincture of orange peel.

Dose—1 to 6 Lozenges.

Unguentum Sulphuris 1 in 5.

A yellow ointment, prepared by rubbing sublimed sulphur 1 oz. with benzoated lard 4 oz.

Antiparasitic ; used in itch, &c.

Sulphuris Iodidum **SI**

A greyish-black shining solid, prepared by heating together in a flask, iodine 4 oz. and sublimed sulphur 1 oz.

Unguentum Sulphuris Iodidi 30 grs. to 1 oz.

A yellow ointment, gradually becoming black, prepared by


tritulating iodide of sulphur 30 grs., and by degrees adding a melted mixture of $\frac{1}{4}$ oz. hard and $\frac{3}{4}$ oz. soft paraffin, and rubbing till every trace of grittiness disappears.

An Antiparasitic and Stimulating application.

SUMBUL RADIX (Sumbul Root)—Umbelliferæ.

The dried, brown, spongy, transverse slices of the root of *Ferula Sumbul* (*Euryangium Sumbul*).

Nervine Stimulant and Antispasmodic.

 Sumbul Root is distinguished from *Calumba*, which it slightly resembles, by its open spongy texture and strong musky odour.

Tinctura Sumbul $2\frac{1}{2}$ oz. to 1 pint.

A brown sherry-coloured liquid, prepared by macerating and percolating Sumbul root (in No. 40 powder) $2\frac{1}{2}$ oz. with rectified spirit 1 pint.

Dose—10 to 30 minims.

Syrupus (See *Saccharum*).

TABACI FOLIA (Leaf Tobacco)—Solanaceæ. *over*

The large mottled-brown, hairy, ovate, dried leaves of *Nicotiana Tabacum*.

Narcotic, Anodyne, Sedative, and Emetic.

TAMARINDUS (Tamarind)—Leguminosæ.

The sweet, brown, soft, fibrous pulp (containing brown shining seeds) of the fruit of *Tamarindus indica*.

Laxative and Refrigerant. Dose— $\frac{1}{2}$ to 1 oz. or more.

It enters into *Confectio Sennæ*.

TARAXACI RADIX (Dandelion Root)—Compositæ.

The smooth, tapering, *fresh* tap root, or the brown, wrinkled, *dried* tap root of *Taraxacum officinale* (*Taraxacum Dens-leonis*), gathered in autumn from indigenous plants.

Diuretic, Laxative, Tonic, and feeble Cholagogue.

Decoctum Taraxaci 1 oz. (*dried*) to 1 pint.

Prepared by boiling for 10 minutes dandelion root (sliced and dried) 1 oz. in distilled water 1 pint, and making the strained product measure 1 pint.

Dose—2 to 4 oz.

Extractum Taraxaci

A rich brown "fresh or green" extract, prepared by evaporating the expressed juice of the fresh root.

Dose—5 to 30 grs., in solution in water, or in pill.

Extractum Taraxaci Liquidum 1 in 1 (*dried*).

. A dark liquid, prepared by exhausting 40 oz. *dried* dandelion root with 80 oz. proof spirit, pressing out 20 oz., treating the marc with water and evaporating to 20 oz., filtering, and mixing the liquids.

Dose— $\frac{1}{4}$ to 2 drs.

Succus Taraxaci

A brown liquid, prepared by pressing out the juice from *fresh* dandelion root, and adding to every three measures one measure of rectified spirit.

Dose—1 to 2 drs.

TEREBINTHINA CANADENSIS (Canada Turpentine)

Coniferæ. (Synonym—Canada Balsam). The straw-coloured, ductile oleo-resin, or turpentine (as thick as honey), obtained by incision from the bark of the trunk and branches of *Pinus balsamea* (*Abies balsamea*), Balm of Gilead Fir.

A Stimulating Expectorant; used for its adhesive qualities.

Dose—20 to 30 grs.

Enters into Charta Epispastica and Collodium Flexile.

OLEUM TEREBINTHINÆ (Oil of Turpentine).

Coniferæ. The limpid, colourless oil distilled, usually by the aid of steam, from the oleo-resin (turpentine) obtained from *Pinus australis* (*P. palustris*), from *P. Tæda*, from *P. Pinaster*, or from *P. sylvestris*, rectified if necessary.

Stimulant, Diuretic, Anthelmintic, and Cathartic. Externally—Rubefacient. The vapour is Astringent.

Dose—10 minims to 4 drs., on sugar, or in capsules, or emulsion, or rubbed up with twice its bulk of mucilage.

Confectio Terebinthinæ 1 in 4.

A pale-brown soft paste, prepared by triturating oil of turpentine 1 oz. with liquorice root (in powder) 1 oz., and adding honey 2 oz., and mixing to a uniform consistence.

Dose—1 to 2 drs.

Enema Terebinthinæ 1 in 16.

Prepared by mixing oil of turpentine 1 oz. with mucilage of starch 15 oz.

Linimentum Terebinthinæ 16 in 21.

A pale-yellowish emulsion, prepared by dissolving camphor 1 oz. in oil of turpentine 16 oz., adding soft soap 2 oz., and distilled water 2 oz.

Counter-irritant and Rubefacient.

Linimentum Terebinthinæ Aceticum 4 in 9.

A mixture of 4 oz. oil of turpentine, 1 oz. glacial acetic acid and 4 oz. liniment of camphor. A substitute for St. John Long's Liniment," which was made with yolk of egg.

An excellent Rubefacient.

Unguentum Terebinthinæ 1 in 2.

A brownish ointment, prepared by melting together oil of turpentine 1 oz., resin 54 grs., yellow wax and lard, of each $\frac{1}{2}$ oz., and stirring till cold.

A Stimulating application to chronic ulcers and burns.

THEOBROMATIS OLEUM (Oil of Theobroma).

~~Sterculiaceæ.~~ (Synonym—Cacao Butter). The yellowish, solid concrete oil, in cakes, expressed with the aid of heat from the ground seeds of Theobroma Cacao.

Used in the preparation of 5 Suppositories.

THERIACA (Treacle).

The uncrystallised, syrupy residue of the refining of sugar.

Only used for making pill masses, into 6 of which it enters, and also into Tinct. Chlorof. et Morph.

THUS AMERICANUM (Common Frankincense)

(Coniferæ.) The yellow, opaque, tough, solid turpentine scraped off the trunks of *Pinus australis* (*P. palustris*) and *Pinus Tæda*.

Externally—Stimulant.

Enters into Emp. Picis.

THYMOL (Thymol)— $C_{10}H_{13}HO$ —Labiatae and Umbelliferae.

A stearoptene, in large, prismatic, odorous crystals, obtained from the volatile oils of *Thymus vulgaris*, *Monarda punctata*, and *Carum Ajowan* (*Ptychotis Ajowan*), by making a soap with caustic soda and treating it with hydrochloric acid. It can also be obtained by reducing the oils to a low temperature.

Antiseptic and Deodorant. Dose— $\frac{1}{2}$ to 2 grs.

TRAGACANTHA (Tragacanth)—Leguminosae.

A whitish, gummy exudation, in horny, curved plates (like the parings of corns)—obtained by incising the stems of *Astragalus gummifer* and other species of *Astragalus*.

Used only for its property of swelling out when moistened with water, and forming a mucilage.

It enters into Pulv. Opii Co., Confect. Opii, Confect. Sulphuris, and

Glycerinum Tragacanthæ 1 in $5\frac{1}{2}$.

A homogeneous, translucent jelly, prepared by mixing 110 grs. tragacanth, in powder, with 1 oz. glycerine and 74 grs. water.

A good Pill Excipient.

Mucilago Tragacanthæ 60 grs. to 10 oz.

A thick opaque liquid, prepared by mixing powdered tragacanth 60 grs. with rectified spirit 2 drs. and pouring in distilled water 10 oz.

Pulvis Tragacanthæ Compositus 1 in 6.

A white powder, composed of tragacanth, gum acacia and starch of each 1 oz., and sugar 3 oz.

Dose—As a Demulcent, 20 to 60 grs.

TRINITRINI LIQUOR (See under Nitroglycerine.)**UNGUENTUM SIMPLEX** (See Adeps.)**UVÆ URSI FOLIA** (Bearberry Leaves)—Ericaceæ.

The small, dried, brownish-green, shining leathery leaves of *Arctostaphylos Uva-ursi*. From indigenous plants.

Astringent, Diuretic, and Sedative to the bladder.

Dose—10 to 30 grs., in powder.

Infusum Uvæ Ursi $\frac{1}{2}$ oz. to 10 oz. (1 hour).

Prepared by infusing bruised bearberry leaves $\frac{1}{2}$ oz. in boiling distilled water 10 oz.

Dose—I to 2 oz.

UVÆ (Raisins)—Vitaceæ. (Synonym—Uvæ Passæ).

The ripe fruit of *Vitis vinifera*, dried in the sun, or partly by the sun's heat and partly by artificial heat, in Spain.


Mildly laxative.

Used only in Tinct. Sennæ, and Tr. Card. Co.

VALERIANÆ RHIZOMA (Valerian Rhizome)—Valerianaceæ. (Synonym—Valerianæ Radix).

The dried yellowish rhizome, with numerous bushy bundles of fibrous roots springing from it, of *Valeriana officinalis*. Collected in autumn from cultivated or wild British plants.

Antispasmodic. Dose—10 to 30 grs.

 Valerian, Serpentry, Arnica, Hellebore, and Senega are often confounded, and the student should remember a few of the distinguishing points. Thus Senega, which is very like Serpentry and Valerian, is recognised by its keel or ridge, which is not marked on the smaller rootlets, but which may be seen, like a little mesentery, at the bendings of the roots, which are of a pure *white* colour internally. The rootlets of Serpentry are smaller than those of Valerian, and are destitute of the strong, unpleasant odour of that drug. Arnica is distinguished by its dark-brown colour, aromatic odour, and peppery taste; Hellebore by its thick root-stalk, and closely-set, long, yellowish-white rootlets, covered with characteristic indentations.

Infusum Valerianæ $\frac{1}{4}$ oz. to 10 oz. (1 hour).

Prepared by infusing bruised valerian rhizome $\frac{1}{4}$ oz. in boiling distilled water 10 oz.

Dose—I to 2 oz.

Tinctura Valerianæ $2\frac{1}{2}$ oz. to 1 pint.

A dark, brownish-red liquid, prepared by macerating and percolating valerian rhizome in No. 40 powder $2\frac{1}{2}$ oz. with proof spirit 1 pint.

Dose—1 to 2 drs.

Tinctura Valerianæ Ammoniata $2\frac{1}{2}$ oz. to 1 pint.

A very dark, reddish-brown liquid, prepared by *macerating* valerian rhizome in No. 40 powder $2\frac{1}{2}$ oz. in aromatic spirit of ammonia 1 pint for 7 days.

Diffusible Stimulant. Dose— $\frac{1}{2}$ to 1 dr., freely diluted.

VERATRI VIRIDIS RHIZOMA (Green Hellebore Rhizome) — Melanthaceæ. (Synonym — Veratri Viridis Radix). The fleshy, dried rhizome, with numerous yellowish, long roots attached, of *Veratrum viride*.

A Drastic Purgative, and Cardiac and Respiratory Sedative.

Tinctura Veratri Viridis 4 oz. to 1 pint.

A brown liquid, prepared by macerating and percolating green hellebore rhizome in No. 40 powder 4 oz. with rectified spirit 1 pint.

Dose—5 to 20 minims.

VERATRINA (Veratrine) (Synonym—Veratria).

An impure alkaloid or mixture of alkaloids, in pale grey, amorphous masses, or in powder, obtained from *Cevadilla* (Melanthaceæ) by adding a concentrated tincture of the seeds to water (which throws down albumen and resinous matters). The watery liquid after filtration throws down the alkaloid on the addition of ammonia. This is purified by solution in acidulated water and further precipitation by ammonia and digestion with charcoal.

It is almost identical with the active principle of green hellebore, and it resembles it in action, but it should not be given internally.

Unguentum Veratrinæ 7 grs. to 1 oz.

A nearly white ointment, prepared by rubbing veratrine 8 grs. with olive oil 1 dr., and adding a melted mixture of soft paraffin $\frac{3}{4}$ oz. and hard paraffin $\frac{1}{4}$ oz.

Local Anæsthetic. Used in Neuralgia like Aconitine.

VINUM XERICUM (Sherry).

A pale yellowish-brown Spanish wine, containing about 17 or 18 per cent. of alcohol; enters into all the wines but *Aurantii*, *Quininæ*, and *Ferri Citratis*—viz., into *Aloes*, *Antimoniale*, *Colchici*, *Ferri*, *Opii*, *Rhei*, and *Ipecacuanhæ*.

ZINCUM (Zinc)—Zn

Zinc of commerce. A brittle metal, obtained by roasting the native sulphide (blende) or carbonate (calamine).

ZINCUM GRANULATUM (Granulated Zinc)—Zn

Prepared by melting zinc, and pouring it in a thin stream into a two-gallon vessel of cold water.

Zinci Acetas $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2, 2\text{H}_2\text{O}$

In thin, translucent, colourless, crystalline plates of a pearly lustre, soluble in less than twice their weight of water; prepared by dissolving carbonate of zinc in acetic acid, boiling, and setting aside till crystals form.

Dose—1 to 2 grs. as a Tonic; 15 to 20 grs. as an Emetic. Chiefly used as an injection in gonorrhœa. (2 grs. to 1 oz.).

Zinci Carbonas $\text{ZnCO}_3(\text{Zn}2\text{HO})_2, \text{H}_2\text{O}$

A white, insoluble powder, prepared by mixing strong hot solutions of sulphate of zinc and carbonate of sodium, boiling, washing, and collecting and drying the precipitate.

Mildly Astringent.

Employed in making the Oxide, Chloride, Sulphate, and Acetate of Zinc.

Calamina Præparata (Native Carbonate of Zinc) (See page 224):

Zinci Chloridum ZnCl_2

In opaque, white, deliquescent rods or tablets; soluble in half their weight of water; prepared by dissolving granulated zinc in hydrochloric acid, and adding chlorine solution to the liquid, which will combine with any iron impurity if present, and be precipitated as a brownish powder on adding carbonate of zinc, leaving the pure chloride of zinc in solution, which is evaporated till a pellicle forms on its surface, and poured into moulds. If no iron be present the chlorine and carbonate need not be employed.

Only used externally as a powerful Caustic, mixed with 1, 2, or 3 parts of flour or powdered starch.

Liquor Zinci Chloridi 366 grs. in 1 oz.

A heavy, colourless liquid, prepared like chloride of zinc, by boiling 1 lb. of granulated zinc in 44 oz. hydrochloric acid and 20 oz. distilled water, filtering, and adding chlorine solution. Carbonate of zinc is now added to precipitate the iron impurities attacked by the chlorine, and the filtered liquid is evaporated to the bulk of 40 oz. If no iron be present the chlorine and carbonate of zinc need not be employed.

1: Antiseptic. Known as "Burnett's Fluid" (which is only half its strength).

Zinci Oleatum (Oleate of Zinc).

Prepared by dissolving with heat 1 oz. oxide of zinc in 9 oz. oleic acid. It acts like the oxide.

Unguentum Zinci Oleati 1 in 2.

Prepared by mixing, with the aid of a little heat, oleate of zinc and soft paraffin, of each 1 oz.

Action similar to Ungt. Zinci Oxidi.

Zinci Oxidum ZnO

A soft, nearly white, insoluble powder, prepared by exposing the carbonate in a loosely-covered crucible to a dull red heat. Oxide of zinc may also be obtained from metallic zinc by combustion ; thus prepared it is white.

A Tonic in spasmodic nervous disorders. Externally—A mild Astringent, and Absorbent in weeping skin affections.

Dose—2 to 10 grs., in pill ; often combined with belladonna in night sweating.

Unguentum Zinci (80 grs. to 1 oz., or 1 in $6\frac{1}{2}$).

A white ointment, prepared by adding oxide of zinc 80 grs. to melted benzoated lard 1 oz., and stirring till cold.

Zinci Sulphas $\text{ZnSO}_4, 7\text{H}_2\text{O}$

In small, colourless, prismatic crystals, obtained by dissolving granulated zinc in diluted sulphuric acid (and, if iron be present, purifying by adding chlorine and carbonate of zinc), filtering, evaporating, and setting aside for crystals to form.

~~It is~~ Often known as White Vitriol, and distinguished from Epsom salt (which it *closely* resembles) by its powerfully styptic taste.

Dose—1 to 3 grs. as a Tonic ; 10 to 30 grs. as an Emetic ; 3 grs. as an Emetic for a child 1 year old. As an Astringent in gonorrhœa 2 grs. to 1 oz., and in Ophthalmia 1 gr. to 1 oz.

Employed in making the Carbonate and Valerianate.

Zinci Sulphocarbolas $\text{Zn}(\text{C}_6\text{H}_5\text{SO}_4)_2, \text{H}_2\text{O}$

Colourless tabular crystals, obtained by heating a mixture of carbolic and sulphuric acids, saturating the product with oxide of zinc, evaporating, and crystallising.

Antiseptic.

Zinci Valerianas $\text{Zn}(\text{C}_5\text{H}_9\text{O}_2)_2$

In minute, brilliant, white, pearly, tabular crystals, with the odour of valerian, sparingly soluble in water ; prepared by mixing strong, hot solutions of sulphate of zinc and valerianate of sodium ; cooling, and skimming off the crystals which form. It can also be prepared by saturating valerianic acid with carbonate of zinc.

Antispasmodic and Nervine Tonic. Dose—1 to 3 grs. in pill.

Zingiber (Ginger)—Zingiberaceæ.

The scraped and dried rhizome of *Zingiber officinale*, in irregular, lobed, yellowish-white chalky pieces.

Carminative and Antispasmodic. Dose—10 to 20 grs.

Syrupus Zingiberis About 1 in 26.

A straw-coloured, muddy syrup, prepared by adding strong tincture of ginger 6 drs. to syrup sufficient to produce 20 oz.

Dose—1 dr.

Tinctura Zingiberis 2½ oz. to 1 pint.

A sherry-coloured liquid, prepared by macerating and percolating ginger *in powder* 2½ oz. with rectified spirit 1 pint.

Dose—15 to 60 mins., diluted.

Tinctura Zingiberis Fortior 10 oz. to 1 pint.

(Synonym—Essence of Ginger). A brownish-red liquid, prepared by percolating ginger *in fine powder* 10 oz. with rectified spirit 1 pint (without previous maceration).

Dose—5 to 20 mins., diluted.

In addition to the above, Ginger and its compounds enter into 16 Pharmacopœial preparations, viz. :—

Confection of Opium.

„ „ Scammony.

Infusion of Senna.

Compound Mixture of Senna.

„ Pill of Squill.

„ „ Gamboge.

„ „ Scammony.

„ Powder of Cinnamon.

Compound Powder of Jalap.

„ „ Opium.

„ „ Rhubarb.

„ „ Scammony.

Aromatic Sulphuric Acid.

Pill of Aloes and Iron.

Wine of Aloes.

Acid Infusion of Cinchona.

PART IV.

THERAPEUTICS.

Acetanilide or **Antifebrin**, first introduced as an antipyretic, has found numerous applications in diseased conditions. When administered to the healthy individual it produces practically no effect upon the body temperature; large doses alter the colour and composition of the blood, the red corpuscles break up, methæmoglobin is formed and the urine becomes coloured with it. Large doses cause extreme depression or paralysis of the heart, though moderate doses raise the blood pressure; the drug passes out by the kidneys, though it is doubtful whether it really increases the amount of solids excreted.

Its use is not free from danger, and numerous instances are recorded where alarming collapse, cyanosis, and gasping respiration have followed even the small dose of 5 grains. Authorities still differ about the relative values of antipyrine and this drug as regards safety; and though the great balance of evidence is in favour of antifebrin, this has not been the writer's experience. It is advisable to begin with a dose of 3 or 4 grs., which can be given every hour for three or four doses. Its insolubility is a drawback. When collapse follows its use, this should be promptly met by stimulants and warmth. As an antipyretic in fevers this drug exhibits a surprising action, lowering the fever heat several degrees in a few hours. There is still doubt about the method by which this result is obtained, but it seems almost certain that it is owing to the action of the drug upon the heat-centres in the region of the corpus striatum, thereby diminishing the heat *production* in the body; at the same time this result is *slightly* increased by the *loss* of heat from the diaphoretic action of the drug.

In all the *specific fevers*, in *pneumonia*, *acute rheumatism*, and *phthisis*, its antipyretic virtues have been demonstrated, though it is still a debatable point how far the course of the disease is

ultimately affected by such a plan of treatment. It may, however, be accepted as a valuable result which keeps the temperature of a typhoid fever patient from rising above 102° F. during a prolonged attack of this wasting disease, and this result is obtainable often by 4 gr. doses of the drug three times a day. It is not advisable to administer it as a routine agent in such cases unless the temperature tends to keep persistently above 103° F.

As an analgesic or pain reliever the effects of the drug are not less remarkable, and in *migraine* it has proved most beneficial, though perhaps inferior to antipyrine.

As it is applicable in every case where antipyrine is indicated, the reader is referred to the article on that drug for further information.

Acacia Gummi is chiefly used on account of its physical qualities for making emulsions, suspending insoluble powders in mixtures, making pill masses, &c. It contains a diastatic ferment, and its solutions are prone to undergo fermentative changes which lead to the formation of irritating compounds, and in medicine only the freshly prepared mucilage should be used.

Externally, it has been used as a soothing application to *burns* and *excoriations*, and internally it is administered in inflamed conditions of the *throat*, *gullet*, *stomach*, and *intestines*; as a basis for cough mixtures, and as a demulcent in the after treatment of cases of irritant poisoning. It acts *mechanically* by covering over the affected surface and preventing the contact of foreign matter or irritating secretions.

A piece chewed in the mouth often affords relief by acting as a Ciliary Excitant, aiding the expulsion of tough mucus probably by exciting the cilia to increased activity through reflex stimulation of the vagus, as will be more fully mentioned in speaking of the action of some expectorants.

In mild cases of *chronic bronchitis*, or where there is hypersecretion of the mucus from the larynx, trachea, and larger bronchi, oftentimes associated with winter-cough, it may be found of service. In these cases any benefit obtained may be explained by its soothing or demulcent action upon the irritated endings of the nerves of the fauces and pharynx which, by reflex action, intensify the tracheal or bronchial cough. Acacia gum possesses feeble nutritive value.

Acidum Aceticum and Acetum—Acetic acid possesses some properties in common with the mineral acids (only of a feebler type), which will be discussed under their names. It is refrigerant when given freely diluted—that is, it allays thirst and fever. There is no evidence that the temperature falls, but a grateful *feeling* of coolness and comfort follows its

administration. It allays thirst by increasing the salivary secretion ; it is mildly astringent and diuretic ; and when taken internally, or applied externally, it checks perspiration, and in full doses it diminishes the bronchial secretion. Notwithstanding its power of drying up the bronchial mucus, as stated by Rossbach, the dilute acid in small doses is a very popular remedy for loosening cough and increasing expectoration. Acetum is the more palatable form for the internal use of acetic acid. Externally, acetic and glacial acetic acids are caustics, and will produce redness, vesication, and sloughing, in proportion to the strength of the acid and the duration of its application. Both the acids dissolve epithelium, and are used to destroy warty growths ; and they have been recommended as local remedies in cancer, with the intention of *dissolving* the cancer cells. A weak solution of acetic acid or vinegar sponged over the body in fevers is of use in lowering the temperature, probably by reflex action. When applied undiluted to *ringworm* it kills the parasite. Vinegar has some local astringent properties, and is used as a hæmostatic in *post-partum hæmorrhage*.

The vapour applied to the nostrils is used as a restorative in cardiac depression ; it acts by reflexly stimulating the vaso-motor centre and raising the blood pressure throughout the body.

The prolonged use of this acid diminishes the number of the red blood corpuscles, causing anæmia and loss of weight, and it is improperly used to correct obesity. The acids in the undiluted state are powerful poisons and antiseptics.

Acidum Arseniosum and its preparations are generally described as Alteratives—that is, they are medicines which affect metabolism and alter or correct some diseased conditions of the system without producing any decided symptoms, or betraying the manner in which they act, save by removing the disease. Arsenic in large doses is a powerful poison, causing in half an hour a burning sensation in the throat, stomach, and abdomen, rapidly followed by violent vomiting, colicky pains, diarrhœa, cramps, excessive thirst, exhaustion, and collapse—a group of symptoms not unlike English *cholera*. Cases are on record where coma and nerve symptoms have followed poisonous doses. After death there are found swelling and redness, with occasional patches of softening of the gastro-enteric mucous membrane, and if the patient have survived long enough, fatty degeneration of the liver, kidneys, and cardiac muscle. These effects are observed whether the arsenic be taken by the mouth, or injected into a vein, or applied to an open absorbing surface. The poison is excreted in the urine, and in the evacuations, saliva, tears, serosity of a blister, and in the sweat, it can be readily detected in the parenchymatous tissues, and has been found abundantly present in the grey matter of the cord.

Chronic poisoning with arsenic is not uncommonly observed in those working with arsenical pigments, or in those living in rooms whose walls are covered with paper containing arsenical pigments ; and it may be produced by the free use of the drug as a remedy for disease. There is irritability of the membranes covering the eye-ball, nose, pharynx, and trachea ; short dry cough, anorexia, vomiting, colic, diarrhœa, and prostration. Sometimes nervous symptoms, as tremors, headache, and partial paralysis of the lower extremities, and bronzing of the skin like Addison's disease are observed.

Arsenic in small doses ($\frac{1}{50}$ gr.) acts by its *local* influence on the gastric mucous membrane as a stomachic, increasing the digestive powers and stimulating the appetite. It is valuable in *gastric neuralgia* and occasionally in *ulcer* and irritative *dyspepsia*, and in the vomiting of chronic *alcoholism*, and in *diarrhœa* coming on immediately after eating ; in these cases 1 to 2 minims of Fowler's solution *before* food may be given with advantage. In larger doses $\frac{1}{20}$ gr. arsenic acts as a nerve tonic ; rapidly gaining an entrance into the blood by absorption, it is carried to the nerve centres and alters their nutrition in some mysterious manner, thus it is found to possess anti-periodic properties second only to quinine, hence its value in *neuralgia*, *angina*, and *ague*.

In *chronic malarial conditions* which resist quinine, arsenic is most useful, and it is well in such cases to begin with a full dose $\frac{1}{15}$ gr. It is also useful as a *prophylactic* against malaria.

In *asthma* it has been successful, especially in the form of cigarette combined with stramonium, &c.

Chorea is perhaps the disease in which the good effects of arsenic are most evident, and failure is generally owing to ignorance in its administration. Considerable experience has shown the writer that it is well borne in this affection, and if improvement does not follow, it is probably because a sufficient dose has not been given, and it may be pushed till the well-known physiological effects are observed, viz. :—redness of the conjunctiva, with smarting and swelling of the eyelids, especially the lower one ; signs of irritation in the membrane of the nose, throat, and mouth ; and indigestion, vomiting, and griping.

In *diabetes* it has been tried without success, though in full doses it has been proved to interfere with the glycogenic function of the liver.

In *cutaneous* affections arsenic should be used with caution in the *acute* stage ; it is in the *chronic*, scaly, and papular skin diseases that the great benefit of arsenic is proved. In *psoriasis*, *lichen*, and even in chronic *eczema* and *acne*, it cures when all other remedies fail, but its action is slow. Hutchinson has

demonstrated that it is *the* remedy for *pemphigus*, and it has been used successfully as a subcutaneous injection in *multiple sarcoma of the skin*.

Shoemaker recommends highly the hypodermic injection of arsenic, beginning with $\frac{1}{10}$ gr. arsenite of sodium, into the areolar tissue of the back; this he increases daily till $\frac{1}{2}$ grain is daily administered. He has obtained success where the remedy has signally failed by the mouth.

Duhring first pointed out that its efficacy was greatest in diseases attacking the most superficial part of the skin, and the results of experiments and clinical experience fully corroborate the accuracy of this statement.

In malignant forms of *anæmia*, in *chlorosis*, arsenic often rapidly tells, even after iron has failed, and it may be frequently combined with this drug advantageously.

Treves has used the drug successfully in cases of non-scrofulous large glandular growths in the neck; and Köbel affirms that he has seen malignant growths disappear under its use. Its use is indicated also in *Hodgkin's* disease.

Good results follow the administration of arsenic in the early stages of *phthisis* and *catarrhal pneumonia*. Brunton believes that by increasing the tissue changes in the epithelial contents of the alveoli—(fatty degeneration of these cells is a constant result of chronic arsenical poisoning)—it assists in rapidly breaking up and removing effused inflammatory products, and so prevents the bacillus of tubercle finding a suitable nidus.

Externally, arsenic is a powerful caustic, causing the death of the tissue to which it is applied. It is chiefly in *cancer*, *lupus* and *epithelioma* that its use has been advocated; but it is dangerous, as enough may be absorbed to cause death, unless applied in a concentrated form and to a very limited extent of surface.

A considerable amount of skill and experience is necessary for the successful use of arsenic in the removal of small epithelial tumours, and it is rather to be regretted that surgeons nowadays very seldom avail themselves of this remedy; and many have not only no experience of it, but strongly discountenance every treatment but the knife. The result too often is seen—especially in the case of epithelial cancers—that the patient shrinks from the knife, and absolutely refuses all operative interference till too late.

In the North of Ireland exist in the rural districts “cancer curers,” and their chief remedy appears to be arsenic. Some of them, no doubt, knowing nothing of the power of their weapon, cause great disfigurement, and even loss of life; but others with

experience and skill contrive to produce marvellously good results, with no disfigurement and little suffering.

Sir Astley Cooper's ointment consists of 1 dr. arsenic, 1 dr. sulphur and 1 oz. spermaceti ointment applied for 24 hours.

Hebra's paste consisted of arsenious acid 5 parts, cinnabar 1 part and simple ointment 8 parts.

Fowler's solution has been used to remove *warts*; Abernethy's lotion consisted of 2 drs. Fowler's solution to 1 oz. water.

Arsenic, unless when given for its *local* action upon the stomach, should always be given soon after a meal, and its effects closely watched for a short time, as some are (though rarely met with) very susceptible to its action, and it is a good rule to begin always with 2 minims of Fowler's solution ($\frac{1}{50}$ gr. arsenic), which may be increased cautiously till 15 minims are reached. Children bear large doses. A choreic child 5 years old may commence with 2 or 3 minims, gradually increased to 10, or even more. It rests upon unquestionable authority that the natives of Styria habituate themselves to swallowing lethal doses with impunity.

The iodide is given in skin diseases in the form of pills containing $\frac{1}{30}$ to $\frac{1}{15}$ gr., and Donovan's solution is a remedy of great value in the *tertiary* forms of syphilis. Asiatic Pills contain $\frac{1}{15}$ gr. arsenious acid with $\frac{3}{4}$ gr. pip. nig. and gum acacia, in each.

R. *Liquoris Arsenicalis* m. lxxx.

Syrupi Aurantii ℥i.

Aquam ad ℥iv. *misce.*

Fiat mistura, capiat ℥j. mensura ter in die post cibos, ex aqua.

Acid. Benzoicum possesses antiseptic properties. When taken in moderate doses (15 grs.) it remains unaltered as benzoic acid in the blood, but unites in the kidneys with glycoll, and is excreted as hippuric acid, rendering the urine acid. It thus acts as a diuretic, and, on reaching the bladder, it exercises an alterative and antiseptic action on its lining membrane, in mild *chronic cystitis* with high smelling, alkaline urine depending upon obstructed flow. It is indicated also in *pyelitis*, and is sometimes found useful in intractable *urethral* affections, accompanied by smarting pain on micturition. It does not interfere with the elimination of uric acid. Though possessed of expectorant properties, it is inferior in this respect to the gum from which it is extracted. Its use has been advocated for *nocturnal incontinence of urine*, and sometimes an external application of a solution of 4 grs., with an equal quantity of borax in 1 oz. water, relieves the itching of many skin affections. The benzoate of

soda may be given in 30 gr. doses ; it acts like the acid, and possesses antipyretic properties.

Acid. Boricum is an Antiseptic without any irritating qualities, causing the destruction of low organisms without endangering in any way the vitality of the living tissues. Hence its great value in surgery as a dressing, either in the form of the official ointment or as a lotion (5 per cent.), or as Boracic Lint, prepared by soaking lint in a hot saturated solution of the acid, and drying.

Boroglyceride—a transparent solid (prepared by Barff by heating boracic acid 62 parts and glycerine 92 parts), can be used as a lotion in the same way as boracic acid. It has a powerful effect in preserving milk and food against putrefaction, and is innocuous. Stockings dipped in a hot solution of the acid, and dried, check effectually fetid perspiration of the feet. It was supposed to have anodyne properties, hence its old name of Homberg's Sedative Salt. 10 grs. to 1 oz. water make a good injection for *gonorrhœa*, *purulent ophthalmia*, and *otorrhœa*. Packing the vagina with the dry acid and absorbent wool gives splendid results in bad *leucorrhœa*. Perez used it internally in *bladder* affections associated with decomposing urine. There are few more striking effects to be observed in the entire range of therapeutics. 10 to 15 grs. three times a day in 2 oz. water will often, after a few doses, cause clear, odourless urine to flow where foul and putrid secretion had existed for months. It acts as an antiseptic on its elimination at the various outlets of the body, and in *diarrhœa* and *fermentative* states of the contents of the stomach its use may be tried.

The writer tried its effects in *typhoid fever*, but found that the stomach was upset by doses sufficient to saturate the system. He often saw excellent results from small doses.

2 or 3 grs. blown into each nostril every 4 hours by an insufflator have yielded good results in *pertussis*. Made into an ointment with lanoline it speedily relieves the *eczema* of children. A strong solution may be used for washing out the bladder where the internal use of the acid cannot be tolerated.

Dr. T. K. Wheeler has shown the writer two cases where general desquamation followed the internal use of the acid.

Acid. Carbolicum is a powerful antiseptic, destroying minute forms of animal and vegetable life, rapidly arresting fermentation, and precipitating albumen, properties which go far to explain its use when given internally. It is useful in chronic *gastric* complaints, accompanied with offensive eructations, acting like creasote ; it destroys *sarcinæ*, and stops fermentation in the stomach, where, by its local action, it often

allays sickness and vomiting and stops diarrhœa. The sulphocarbolates of sodium and potassium act in a similar way and have been used in *typhoid* and other fevers.

Carbolic acid inhaled, as vapour or atomised spray, acts very effectually in checking the expectoration of *chronic bronchitis*, is invaluable in *gangrene of the lung*, and has the power of cutting short *influenza*. Applied as a gargle (1 dr. to 1 pint) in various pharyngeal affections, or used as a lozenge, it causes anæsthesia of the mucous membrane, diminishing the reflex irritability in the palatal and other muscles, thus effectually preventing distressing attempts at swallowing, and by this means cutting short the course of *acute tonsillitis*, and relieving follicular *pharyngitis*.

It is in its external application that carbolic acid has won for itself a high name among surgical remedies. Applied to the skin, it acts as a painless caustic, causing the death of a very superficial film, and, in a similar way, it may be painted over exuberant granulations. The lotion (1 oz. to 1 quart) effectually destroys the foul smell of *sores* and *ulcers*, exciting in them healthy action, and hastening the healing process. Applied to *fresh wounds*, it diminishes the risk of profuse suppuration, and is invaluable as a dressing after *amputations*.

Carbolic acid, when applied to the skin or wounds, in concentrated solution, acts as a local anæsthetic, diminishing sensibility, and if the cork of the carbolic acid bottle be laid against the skin so as to affect a small area with the acid, the hypodermic or aspirator needle can be almost painlessly inserted. Its anæsthetic effect when applied to carious teeth is often marked, for this purpose it is best mixed with collodion (1 to 3). It is used successfully as an application to various *parasitic skin diseases*, and the pure acid is the best caustic we possess for *uterine ulcerations*. A strong solution applied to an extensive raw surface, may be absorbed, and produce the same poisonous effects as a large internal dose, causing violent *gastro-intestinal irritation*, *syncope*, *disturbance of respiration*, *muscular weakness*, *coma*, and *convulsions* by its action on the vaso-motor centre, medulla, and cord; hence, when *extensively* employed, its effects should be watched, the urine through which it is eliminated often turning almost black. Serious symptoms may supervene without this dark discoloration, and Bruce advises that the urine should be tested for disappearance of sulphates in cases where fainting and collapse supervene during the use of carbolic dressing — the absence of sulphates indicating danger. On stopping its application no further trouble will be found. Poisonous doses at first cause a rise in the blood pressure, which soon gives place to a great fall; as paralysis of the nerve

centres, respiration, and heart occurs, the blood becomes dark and loses its coagulability.

Deep hypodermic injections of $\frac{1}{2}$ gr. of the acid in 20 minims of water have been found most successful in deep-seated *inflammations*, *glandular* and *joint swellings*, *erysipelas*, *poisoned wounds*, *synovitis*, &c.

Sir A. Clark treats *hay-asthma* by applying the following with a brush to the pharynx through the nares—Glycerine of Carbolic Acid 1 oz., Hydrochlorate of Quinine 1 dr., Corrosive Sublimate $\frac{1}{2}$ grain.

The acid is best administered in the form of a pill; for external application, the strength of the preparation does not depend upon the amount of acid contained in it, but upon the nature of the solvent. 1 in 40 of water, which is the strength of the "Lotion" used for all ordinary purposes, produces more effect than "Carbolic Oil" composed of 1 part acid and 10 parts olive oil. Koch has shown that this latter preparation will not kill germs. It is, however, a good dressing for *burns*.

Rx. *Acidi Carbolici* *m. xxiv.*

Pulv. Glycyrrhizæ *gr. xlviij.*

Fiat massula, et divide in pilulas xvj. Capiat unam ter in die.

Acid. Chromicum possesses the power of killing all low organisms, oxidising organic matter, coagulating albumen and destroying the tissues with which it comes in contact. It is thus an antiseptic, disinfectant, and caustic, and is chiefly used in the concentrated form to destroy *condylomata*, warty, and other superficial growths, which it does effectually. Two drs. to one gallon water make an inexpensive antiseptic and disinfecting lotion for *putrid sores*, *leucorrhæa*, *ozæna*, *sweating of the feet*, &c., and a lotion of 10 grs. to 1 oz. has a decided effect upon *syphilitic* and *gouty diseases of the tongue and throat*. Death has resulted from the absorption of the acid when too freely applied externally.

Acid. Chrysophanic. (See Chrysarobin.)

Acid. Citricum and **Succus Limonis**, identical in action with Tartaric acid, are grateful refrigerants, a small quantity sucked in the parched mouth producing a refreshing moisture by stimulating the salivary glands, and probably also all the glands of the mucous membrane down to the stomach. When administered in health, the urine becomes acid under their use, but in *fevers* they do not increase the acidity of the urine.

Salts of the vegetable acids act as refrigerants, but they differ from the acids in increasing the alkalinity of the blood, being oxidised and converted into carbonates, in which state they pass out in the urine, increasing its alkalinity or rendering it alkaline if acid. Citric and tartaric acids are largely used in medicine to make effervescing draughts, which, on being swallowed whilst the carbonic acid is being given off, act as sedatives to the mucous membrane of the stomach, the gas having a soothing influence upon the terminal filaments of the nerves of this organ. Upon page 199 will be found a useful table of the requisite proportions of different alkalies to make an effervescing mixture, and below is the formula for one of these. Lemon juice acts like citric acid, but is found to be more efficacious in *scurvy*, acting in some way as a blood restorative, and, in addition to being a specific in this disease, it is a prophylactic. It has been administered in *acute rheumatism*. A decoction of *fresh* lemon is believed to possess antiperiodic powers, and is strongly recommended in *ague*, where its effects are said to be equal to quinine and arsenic. A solution of citric acid is largely used as a substitute for lemon juice.

R. *Potassii Bicarbonatis* ℥vj.
 Aquæ Destillatæ ℥xij.

Solve, capiat cochlearia duo ampla cum succi limonis recentis cochleare amplo in effervescentia ter in die.

Acid. Gallicum and **Acid. Tannicum** are vegetable astringents. Tannic acid coagulates albumen and mucus, but gallic does not. The way in which these substances produce their astringent effect cannot, however, be explained upon merely chemical principles. They were generally supposed to act by "tanning" or "condensing" the skin, tissues, and membranes with which they came in contact, and it was believed that when taken internally they acted directly upon the muscular tissue in the arterial coats and lessened the calibre of the small vessels. Rosenstirn's experiments, however, prove that the vessels are dilated, and that the partly chemical and partly vital action of these acids is yet to be explained.

Gallic acid is inferior to tannic as a local astringent, and tannic when administered is changed to gallic in the stomach and intestines, and as such passes into the fæces and urine, hence gallic acid is chiefly the one selected for internal administration. Stockman found that when pure tannin was given by the mouth, gallic acid appeared in the urine along with *traces* of tannin, but

when tannate of soda was given *large* quantities of tannin with a *little* gallic acid appeared in the urine, the uncombined tannin being at once changed into a tannate of albumen in the stomach, which, being slow of absorption, has time in the intestines to be almost entirely converted into gallic acid. Tannate of soda, on the other hand, being rapidly absorbed by the stomach, passes out in the urine without change. He finds that solutions of both acids *dilate* the blood vessels, and he concludes that as remote astringents these acids are valueless save in the faint action they possess in common with all acids in diminishing the alkalinity of the blood and thus increasing its coagulability. Nevertheless, the weight of clinical evidence goes to show that these acids are useful in *internal hæmorrhages*, in *excessive secretions* from different parts of the body, and for cutting short *local inflammations*, as in various forms of *sore throats*, *nasal catarrh*, and *gonorrhœa*. By their action the secretion of the *bowel* is slightly lessened, the contents become more solid, and the amount of albumen in *albuminuria* may be diminished. The glycerines will be found the most convenient preparations, or either acid may be given in 5 to 10 gr. doses, dissolved in water, or made into a pill with a little glycerine. The gall and opium ointment is an astringent remedy for painful *hæmorrhoids*, and the Glycerine of Tannin for enlarged tonsils and relaxed conditions of the throat. Quite recently an attempt has been made to revive the faith in Tannin as an internal remedy in *phthisis*.

Tannic acid is used as an antidote in *poisoning by the alkaloids* to form tannates which are only partially soluble.

Acid. Hydrobromicum is not used for any *acid* qualities, but for the *sedative* properties which it possesses in common with bromide of potassium; its use is not followed by the depression which accompanies the administration of the potassium salt. (See under Bromum.)

Acid. Hydrochloricum, Nitricum, and Sulphuricum.
—These acids form a group possessing definite therapeutical qualities, and frequently are referred to as the “Mineral” acids. They all, when applied externally, act as powerful corrosives and escharotics when undiluted, and when administered internally in their strength they act similarly, destroying the tissue of the digestive tract, and producing the well-known effects of corrosive poisons. In both these cases their action may be regarded as *hemical*, as they in like manner act upon dead tissues. These results are explained by their action on albumen and by their great affinity for water, which they abstract so rapidly as to cause the death of the tissue containing it. Nitric acid is the one selected when we wish to avail ourselves of this property, and it is used in *phagedenic ulceration* and *sloughing* by applying

the strong acid with a stick. It destroys all unhealthy tissue, at the same time altering the condition of the surrounding living parts so that diseased action is stopped. It is likewise used to destroy *warty growths* and to stimulate *sluggish ulcers*, and it is useful when applied to the interior of the *uterus* in chronically inflamed conditions. Its action is very superficial, because it cannot redissolve the albumen which it precipitates and which thus limits its penetration into the tissue.

Strong hydrochloric acid, diluted with an equal weight of honey (making a linctus), is used to destroy the false membrane in *diphtheria* and *ulcerations of the throat*.

Strong sulphuric acid is used as an application to *carious bone*, *cancer*, and *chancres*, and phosphoric acid acts as a powerful caustic. Diluted with from 200 to 300 times their bulk of water, they form good astringent lotions for *sluggish sores*, or gargles for relaxed conditions of the *throat*, diminishing the secretion of the part to which they are applied.

Roberts recommends an injection of weak nitric acid to dissolve phosphatic stones in the bladder.

Internally, the mineral acids stimulate the alkaline secretions of the body and, according to Ringer, check the acid ones; thus the saliva, bile, and intestinal juice are increased, and the secretion of acid gastric juice lessened. This gives us an explanation of the value of these acids in *dyspepsia*. Hydrochloric acid, which is a constituent of the gastric juice, is particularly useful in chronic *gastric* complaints, a dose administered *before* a meal checking the excessive irritating acid secretion and stimulating the appetite; whilst after a meal, in a different class of cases, the digestion is accelerated by supplying the deficiency of acid, as pepsin refuses to dissolve fibrin unless free acid is present.

The mineral acids are rapidly absorbed, having great diffusive power, and on entering the blood they combine with bases, freeing weaker acids from their salts, and thus rendering the blood less alkaline. Whilst passing through the liver they probably influence the tissue changes which take place between the blood and the hepatic cells, as their administration diminishes the amount of urea secreted. They are thus cholagogues. They appear in the urine as salts of urea. They have an astringent effect upon the muscular tissue, and consequently are useful in checking *hæmorrhages*. The dilute or aromatic sulphuric acid in 20 minim doses, freely diluted, answers the purpose well, and also checks *sweating*.

As regards the astringency of the mineral acids, sulphuric is the strongest and hydrochloric the weakest, and their effect upon the bowel is probably *local*.

The free administration of the diluted mineral acids renders the urine slightly more acid than the normal condition, and hence their indication in the *oxalic* and *phosphatic diatheses*, but these remedies do not cause the already alkaline urine to become acid.

In *fevers*, the administration of the diluted mineral acids (the Swedish treatment) is followed by good results. They make up for the deficiency of acid in the gastric juice, which is a feature in fever; they increase the saliva and remove the parched condition of the throat and tongue; they help to neutralise the excessive alkalinity of the blood, and to correct the acrid alkaline motions of *typhoid fever*. Sometimes moderate doses of the dilute hydrochloric acid act as a mild purgative in fever.

℞ *Acidi Hydrochlor. Dil.* ℥iv.

Tincturæ Calumbæ ℥iij.

Infus. Quassiæ ℥vij. *misce.*

Fiat mistura, cujus capiat cochleare amplum ter in die ex aqua ante cibos.

Acid. Hydrocyanic. Dil.—Prussic acid is the most rapid and fatal poison known, killing, if administered in a concentrated form, in less than a minute, by acting as a profound nerve and cardiac sedative, and paralysing all the cerebro-spinal nerves. After a large dose the patient falls, his respiration becomes convulsive, pupils dilated, and face congested, death ensuing by rapid asphyxia, succeeding convulsions and coma, though the blood in a quickly fatal case may be florid in the veins. Brunton believes that the florid colour of the venous blood is not, as is believed, caused by diminution of the oxidising power of the blood, but is owing to the rapidity of its flow through the dilated peripheral vessels, which prevents the usual tissue change. If life be prolonged the blood loses its florid hue. It is used in medicine chiefly on account of its sedative action when applied to the peripheral extremities of irritated or painful nerves; hence its use in painful *gastric* disorders, accompanied by *vomiting*, 3 minim doses in *gastric ulcer* or *cancer* often giving much relief, and, by blunting the sensibility of the nerves, it is useful in the reflex vomiting of *pregnancy* and for the cough of *phthisis*, and externally allaying the itch of *urticaria*, *lichen*, &c., when applied in those latter cases as a lotion of 1 in 40—care being taken that the skin is not broken.

The preparations of bismuth may be ordered with great advantage with Prussic acid in stomach affections.

☞ For Poisoning see Index of Poisons at the end of the Book.

R. *Acid. Hydrocyanici Dil.* *m. lx.*
 Bismuthi Carb. *gr. lxxx.*
 Mucilaginis Recentis *ʒij.*
 Aquam ad. *ʒiv. misce.*

Fiat mist. cujus capiat ʒj. ter in die, ante cibos p.p.a.

Acid. Lactic. possesses properties similar to those of the mineral acids as described under Hydrochloric. The dilute acid has a solvent action when applied in diphtheria. Internally it is a valuable aid in *atonic dyspepsia*, and a grateful refrigerant which has done good service in *diabetes* and *vesical catarrh*. Sour buttermilk will be found superior in most respects to lactic acid for internal use. This the writer has often proved, especially in the vomiting of *chronic Bright's disease*, and in the *phosphatic diathesis*. The writer has used the strong syrupy acid with success in *lupus*; it only attacks the diseased tissue, and is not very painful, and it leaves a good scar. See Dictionary of Treatment, page 483. Lennox Browne has successfully applied a 50 per cent. solution in *pharyngeal tubercle*.

Acid. Meconic. is an acid with doubtful narcotic properties obtained from opium. It is the constituent of opium which gives the blood-red reaction with soluble proto-salts of iron. It is only used to make solution of bimeconate of morphine.

Acid. Nitric. resembles hydrochloric acid in action, under which head its chief uses are mentioned. It is also recommended as a remedy in *syphilis*, but its efficacy probably depends upon its general tonic action. It has been supposed to exert an alterative or specific action upon the liver, but it is inferior to the following:—

Acid. Nitro-Hydrochlor. Dil.—In addition to the tonic properties possessed by the mineral acids, the experiments of Rutherford prove it to be an active hepatic stimulant. As a restorative in prostration and loss of appetite, following prolonged mental labour, combined with a vegetable bitter, in 15 to 20 minim doses, it will be found the most satisfactory and efficient tonic we possess. It should be *recently prepared*. Used in the form of a bath in *chronic congestion of the liver*, by mixing 1 oz. strong nitric and 2 oz. hydrochloric acids with 2 gallons water at 98°, it will be often found useful.

Acid. Oleic. and **Oleates.**—The B.P. oleates are used as substitutes for mercurial and zinc ointments, whose actions they closely resemble. There is considerable difference of opinion upon the question of whether the oleates are absorbed by the skin

—Shoemaker affirms they are not. The writer believes that a chemically pure neutral oleate is not absorbed, but that a preparation with a large excess of oleic acid, which is unstable and certain to be decomposed before its application, is likely to be absorbed, just as common mercurial ointment can easily find its entrance into the system through the skin. This is the explanation of the opposite views upon this subject. The zinc oleate of Shoemaker is a soft unctuous powder of great value in *intertrigo*, *eczema*, and nearly every form of *superficial cutaneous inflammation*. The official oleate and its ointment can be used for similar affections, whilst the mercurial oleate is a valuable remedy in *chronic glandular and joint affections and parasitic skin diseases*, especially when attacking the scalp or beard. The oleates of copper, silver, and the various alkaloids are elegant and cleanly vehicles for the application of these remedies.

Oleic acid itself is only used in the manufacture or preparation of the oleates.

Acid. Phosphoric. has no properties beyond those possessed by the mineral acids, as described under Acid. Hydrochloric. It is refrigerant and tonic, and is supposed by some to have the power of dissolving phosphatic deposits and bony tumours. It makes an agreeable drink in *diabetes*, without any of the therapeutical virtue of free phosphorous. The concentrated acid is a strong caustic, and recently Grossich advocates the use of a 10 per cent. solution as a dressing for *ulcers* and an injection into *scrofulous glands and joints*.

Acid. Salicylic. is a powerful antiseptic and antiferment. A 2 per cent. solution speedily kills bacteria and stops fermentation. It is used as a surgical dressing either in the form of "lint" or "wadding," or "ointment" (1 to 27), or "lotion" (acid 10 parts, borax 20, water 100), or as "oil" (1 to 50 olive oil). Whilst the power and certainty of its action as an antiseptic, together with its mildness, combine to make it so valuable, it has the great disadvantage of being *non-volatile*. It has been used with benefit as a local antiseptic application in *diphtheria*, and a solution in collodion (1 to 2) speedily destroys *corns* and *lupus*, acting only on the *diseased* cells. The soda salt has little lethal effect upon germs; a solution has been used as a local application to the joints in *acute rheumatism*, in itching from *eczema* and various causes, and to check fetid perspirations in the feet and armpits.

Internally, salicin and salicylic acid have proved remedies of much value in various *febrile diseases*, but it is mainly in *acute rheumatism* that the good effects of these drugs have been duly appreciated. Maclagan prefers salicin to the acid.

Salicylic acid, in doses of about 15 to 20 grs. every 2 or 3 hours, soon produces effects in the healthy individual like quinine

—fulness in the head, buzzing in the ears, disturbances of vision, and if the dose be very considerably increased in frequency and amount, other more alarming symptoms supervene, as deafness, squinting, sighing respiration, restless delirium, with dark albuminous urine, involuntary evacuations and convulsions (it does not reduce the temperature in health). These symptoms may terminate fatally by its paralysing action upon the respiration, though it probably requires an enormous dose of the pure acid or its salts to bring about such an issue.

Professor Charteris' valuable researches prove that these symptoms are produced by impurities, and the acid, as purified by his process only, should be employed.

Salicylic acid is excreted by the saliva and perspiration, and appears in the urine soon after administration, and various theories are held as to its condition in the blood, some holding that it exists there as the sodium salt (Salkowski), others that it becomes an albuminate (Feser), while Binz believes that the sodium salt is decomposed in the blood by the carbonic acid, and acts there as salicylic acid. Latham claims to have proved that the acid is changed into salicyluric acid and prevents the formation of uric acid in the system.

Dr. Haig has recently pointed out the utility of salicylates in preventing the accumulation of uric acid in uric acid diseases, and thus explains their value in *migraine* and *epilepsy* and in *gout*, especially in preventing attacks of gout.

The most convenient and desirable form for the administration of the drug in disease is the soda salt. In *rheumatic fever* most decided results follow this method of treatment. The temperature is reduced generally within 24 hours. Often pain and temperature are most markedly diminished in 12 hours.

30 grs. of salicylic acid, or salicylate of sodium, in half an ounce of any infusion or in water every two hours for 3, 4, or 6 doses, as the severity of the pain and height of the fever heat indicate, will be found the best practice to adopt. Profuse sweating will generally follow after each dose.

Often patients express relief after the first or second dose, and it is not unusual to have a fall of 3 to 5 degrees at the end of 24 or 48 hours, or a total cessation of *all* the symptoms of the disease. The writer has seen equally satisfactory results follow $\frac{1}{2}$ oz. doses in the horse.

It is affirmed that the chances of *heart* complications are lessened and that the course of the disease is cut short by this treatment. The writer, after carefully watching the effects of the soda salt in *acute rheumatism*, believes that whilst it is invaluable in its speedy and certain relief of pain and fever heat, it nevertheless does not appear to cut short the real duration of the attack, and does not more than appreciably prevent

heart complications, but permanent valvular lesions appear to be less frequent afterwards. Pain and fever will return if it be withheld, but yield again on its administration; still, after a considerable trial of its use most observers will arrive at the conclusion that it is an inestimable boon, and that it should be always given in this disease. Latham holds that it is decidedly curative, but he insists upon the use of the pure acid obtained from the wintergreen.

In the *hyper-pyrexia* of acute rheumatism it is not safe to trust alone to the antipyretic virtues of either salicylic acid or quinine; the cold bath should be employed. MacLagan found the cerebral symptoms produced by large doses of salicylic acid to disappear on the substitution of salicin for the acid.

For the high temperatures in other diseases (typhoid fever, scarlatina, pneumonia, &c.), this remedy has been found useful, but in no other affection than in rheumatism probably will it be found to supersede quinine. It possesses very decided *antiperiodic* power.

It is a cholagogue, and increases the amount and fluidity of the bile, and may be given in cases of *gall-stone*.

It is recommended in small doses to relieve *headache*, and in larger doses in *phlegmasia dolens*, *neuralgia*, and *lumbago*. ✓

Acid. Sulphuric.—The astringent, tonic, and caustic properties of this remedy will be found mentioned along with the other mineral acids under the head of Acid. Hydrochloricum. It should be remembered that it is valuable as an astringent only in bleeding from *mucous* surfaces.

Acid. Sulphurosum is used in medicine on account of the destructive effect which it produces on the lower forms of life, both animal and vegetable. Hence it is useful in *parasitic skin diseases*, applied, diluted with an equal bulk of glycerine; and internally in *pyrosis* and *fermentative conditions* of the *stomach*, depending upon the existence of *sarcinæ*. It has been occasionally vaunted as a remedy in *zymotic diseases*. It should be given in doses of $\frac{1}{2}$ to 1 dr. freely diluted. It has been used as a spray in *laryngeal phthisis*.

Acid. Tannicum is fully discussed under Acid. Gallicum.

Acid. Tartaricum is identical in therapeutic action with Acid. Citric. (which see).

Aconite is one of the most potent remedies in the Pharmacopœia, producing paralysis of the sensory terminals, and causing death by paralyzing the respiratory centre or depressing the heart without affecting the cerebral faculties. Before this event takes place various alterations in the sensory and motor apparatus occur. Weber found that a feeling of tingling

occurred throughout the body, beginning in the most sensitive parts and extending gradually to the least sensitive, but the terminations of the motor and sensory nerves appear to be irritated before being paralysed. There is great depression of the entire nervous system with diminished sensibility and loss of power of all the nerves of the spine and medulla. The pupils oscillate between contraction and dilatation, finally remaining widely dilated. The vaso-motor centre as well as the respiratory being at first irritated and finally paralysed, the temperature and blood pressure fall, vomiting and convulsions generally appearing before death, which results from cessation of respiration.

It is chiefly on account of its distinct sedative action on the heart that aconite is useful, moderate doses, as pointed out by Ringer, reducing the pulse to 40 beats in the minute, and lowering the respiration. He explains its action on the ground of its paralysing all nitrogenous tissue, and thus affecting the ganglia, nerves, and muscle of the heart. Following the reduction of the pulse in febrile conditions, the heat of the body falls steadily, and the skin keeps moist, and the urine is increased, aconite acting as a diaphoretic and diuretic, though this diaphoretic action cannot account for the reduction of temperature.

These effects produced by aconite have led to its application in the treatment of inflammations—as *pneumonia*, *peritonitis*, *rheumatism*, and *erysipelas*—some authorities going so far as believing that if the remedy is administered sufficiently early, the inflammation or fever is often prevented. It seems to be especially useful in *acute throat affections*. It should be given in small doses—1 minim of the tincture every 15 minutes for six or eight doses, then every two or three hours, and kept up while the thermometer registers above 100°F. This course, which appears to many to be merely the treatment of symptoms, should not interfere with the exhibition of other remedies which aim at destroying the cause of the disease. Aconite is found very useful in *neuralgia* of the fifth nerve, and it increases the efficacy of quinine in most neuralgic conditions. Success has followed its administration in the vomiting of *pregnancy*. Externally it paralyses the sensory nerves, causing tingling when applied to the skin or tongue, and thus it often relieves *pain*, especially when rubbed in, in the form of unguentum aconitinæ, over the course of the affected nerve, or used as a liniment in *rheumatism*, *sciatica*, *lumbago*, &c.

Adeps, Adeps Benzoatus, and Adeps Lanæ are used solely as external emollient applications, affording a uniformly soft and unirritating base for the preparation of ointments containing more active substances. The benzoin is added to

resist the putrefactive changes to which lard is so liable. Lano-line is readily absorbed by the skin, but it is very doubtful if it assists the absorption of alkaloids or other active drugs. It forms an excellent basis for ointments, and possesses the property of absorbing water to a surprising extent; it is stable, bland, unirritating, and antiseptic. Its stickiness is overcome by mixing a little lard with it.

Æther is used in medicine with three different intentions—
1. As a *local anæsthetic*, thrown in the form of spray upon the skin or gum, when the reduction of temperature caused by its rapid evaporation becomes so great as to freeze the part, depriving it of all sensibility, relieving superficial neuralgia, and permitting the performance of minor cutting operations or the extraction of teeth, and for the lightning pains of *ataxia*. The ether used for this purpose is the official “Æther purus.” 2. It is administered *internally* in moderate doses; when it reaches the stomach it stimulates its movements, increases the gastric secretion, expels flatus, and acts as a powerful diffusible stimulant and narcotic, like alcohol; it was consumed largely in some parts of Ireland as a substitute for whiskey; it is antispasmodic, and is useful in *bronchitic asthma*, in doses of $\frac{1}{2}$ to 1 dr. In emergencies, where a rapid stimulant is demanded, it may be injected hypodermically. Durande’s remedy for the solution of gall-stones was a mixture of turpentine and ether. 3. It is *inhaled* to produce general anæsthesia, affecting first the cerebrum, then the sensory, and next the motor centres of the cord, next the sensory, and finally the motor centres in the medulla. It has been held to be safer than chloroform, having a stimulating action on the heart and vaso-motor centre; when death occurs, which is rare, it is owing to the paralysis of the respiratory apparatus. It is, on the other hand, more disagreeable and more tedious, and sometimes produces bronchial irritation, and is more liable to be followed by vomiting. The results of the recent Hyderabad Commission, however, are decidedly in favour of chloroform as the safest of anæsthetics.

Pure anhydrous washed ether S.G. .720 is best for inhalation; methylated ether S.G. .735 answers, however, perfectly well. It may be given, poured upon a sponge, in any form of inhaler which fits the face, 1 oz. being poured on at first, and kept up till symptoms of insensibility show themselves. The vapour should be administered in as concentrated a form as possible. If the sponge be warmed, by wringing thoroughly out of hot water, the effect is sooner produced. The writer has used a pint and a half in one instance before insensibility supervened. It can be administered in conjunction with nitrous oxide, which may be used to produce insensibility, which can afterwards be

kept up for a considerable time with ether, or it may be mixed with chloroform as in the A.C.E. Mixture.

Vedd injects 5-10 minims of pure ether into *wens* frequently, and in a fortnight finds their contents liquid; he then makes an incision, after which they shrivel up.

Æther Acetic. resembles ether in action, only it is more agreeable and milder, and acts as a mild antispasmodic and diaphoretic in doses of half a tea-spoonful in sweetened water or sherry. Hoffmann's Anodyne possesses similar qualities.

Æther Nitrous—as found in the Spirit. Æther. Nitrosi—though regarded by many as a domestic remedy, is a very efficient and agreeable diaphoretic or diuretic, especially useful in dropsies in the debilitated. It possesses powerful narcotic properties like ether, when given in large doses. Smith attributes its diuretic effect to its stimulating action on the heart.

It is invaluable in all *febrile affections of childhood* characterised by a hot skin; and in full doses, 12 or 15 minims for a child one year old, it soothes the irritation of *delayed dentition* better than any other safe remedy.

Prof. Leech has drawn attention to its value in reducing arterial tension, like nitrite of amyl and other nitrites, and he has shown, contrary to what might be expected, that its influence upon the circulation is of considerable duration.

Alcohol Amylicum—Fousel oil—is seldom used in medicine. It is employed by the poorer classes as a counter-irritant, and is used for the preparation of valerianate of sodium and nitrite of amyl.

Alcohol Ethylicum is alcohol deprived of almost all water. It is used in the preparation of chloroform and ethylate of sodium; and although really introduced into the B.P. for its solvent action, to make tinctures, &c., and not for its therapeutic properties, still the student must have a clear knowledge of the action of alcohol.

The popular term of "Stimulants," as applied to the various preparations containing alcohol, is very apt to mislead. In large doses it should be regarded as a true narcotic, like chloroform, ether, or, in some respects, opium. Narcotics at first cause a period of stimulation or excitement, afterwards followed by sleep and coma; and alcohol differs from the substances just mentioned only in degree, its period of excitement being longer.

Small doses increase the flow of saliva and gastric juice, improving the appetite and digestion, augment the force of the heart, dilate the capillaries of the skin, and increase the mental activity—probably by dilating the cerebral vessels. Poisonous doses at first stimulate and then paralyse the nerve centres in

the inverse order of their development, beginning with the higher mental or emotional centres, and proceeding in order to the lowest, soon destroying reflex action, producing profound coma, dilated pupils, pallor of the skin, feeble pulse, a reduced temperature, embarrassed respiration, and, finally, death from paralysis of the respiratory or cardiac centres.

By hindering or lessening oxidation, poisonous doses reduce the temperature from 2° to 5° or even 10° , and often small doses cause it to fall half a degree; this effect of small doses is not constant, and is not met with in those having become accustomed to its prolonged or intemperate use. Brunton has clearly shown that the early symptoms are owing to the action of the alcohol upon the vascular system by causing dilatation of the superficial vessels, and allowing the great sheet of cutaneous capillaries to cool the blood by transmission and radiation. When the surrounding air is *very cold*, these vessels, which ordinarily contract and prevent reduction of temperature, dilate to such an extent under alcohol as to cause the patient's death speedily by loss of heat in the arctic climates. When given in small doses it appears certain that a fair quantity (it is not clear how much) disappears in the system, and is used up as a food like sugar, producing vital energy and heat.

Alcohol is given very freely by many in *fevers* and in *acute diseases*, some believing in its value as a true stimulant to the vascular and nervous systems; others maintain that by lessening oxidation it retards metabolism and saves tissue waste, others believing only in its powers of reducing temperature. Elaborate directions are given for its exhibition in such cases, some authorities relying upon signs of failure in the heart and general circulation, others looking for indications from the exhausted nervous system. (See the Author's Dictionary of Treatment, page 894, for the rules for its exhibition in fevers). Most authorities would probably agree (1) that alcohol is not necessary at all in the *majority* of cases; (2) that often unpromising cases pull through without it; (3) that in severe cases it cannot be safely withheld from those habituated to it; (4) that occasionally by the use of alcohol, life may be saved which would otherwise be lost; and (5) that it is rarely needed in the very large doses prescribed by some—6 to 10 oz. whiskey may be regarded as representing a liberal daily allowance.

One large dose of alcohol at bed-time is a good narcotic in very many diseases, if the patient has been a stranger to the drug. In sleeplessness from overwork, neuralgia, &c., its value is apparent; and, moreover, the danger of the patient becoming the victim of intemperance (a danger never to be lost sight of) is reduced to a minimum when given in one large dose, like a draught of laudanum or chloral, after his retiring to bed. It

should be given made in punch ; and whiskey is the best form of alcohol for this purpose. In many inflammatory diseases the addition of 30 grs. of nitre is an improvement. The effects are not always in proportion to the percentage of alcohol contained in wines and spirits, since the subtle ethers, which develop as the liquid becomes aged, produce characteristic effects, and the impurities often present play an important part.

Brandy, Whiskey, Gin, and Rum contain about 50 per cent. of alcohol ; Port Wine, 16 to 17 ; Sherry, 15 to 16 ; Madeira, 14 to 15 ; Claret, 5 to 7 ; Porter (bottled) and Ale (bottled), 5 to 6.

Externally, spirit is used as a dressing. The ordinary "spirit lotion" is made by adding 1 part of the official Spt. Vini Rect. to 3 of water, or equal parts of whiskey and water, and so constituted may be used as an evaporating lotion, when applied to any part on lint, and the vapour permitted to escape freely. It thus cools the part, and by directly abstracting heat it modifies inflammatory action. When spirit lotion is applied on lint, and covered in with oiled silk, so that its vapour cannot escape, then it acts like a mild, stimulating poultice, possessing antiseptic properties. (See under Cataplasmata.) Strong solutions harden the skin and tissues, and are useful in preventing *bed-sores*.

Aloe Barbadensis and Aloe Socotrina are cathartic, chiefly acting on the large intestine, especially on its lower half, producing—in doses of 2 to 4 grs., after about 12 hours—copious softened evacuations, generally accompanied by some griping. It produces its effects when sprinkled over a blistered surface, or injected into the blood, probably by being eliminated by the mucous membrane of the colon, which it stimulates to increased action. It has a decided stimulating effect upon the liver, and increases the quantity of bile, at the same time acting upon the duodenum, but it only acts as a purgative when bile is present in the duodenum or intestines. Very large doses cause watery motions by increasing the intestinal secretion. Very small doses, as $\frac{1}{8}$ to $\frac{1}{4}$ gr., increase the appetite and give tone to the stomach, acting like other vegetable bitters.

The effect of this drug depends more upon the state of the bowels than upon its dose. 2 or 3 grains will be found enough for ordinary results, and, if followed in 8 hours by a mild saline, will prove a very effective cathartic.

It is in *chronic constipation* that aloes is most used, and $\frac{1}{2}$ gr. in a dinner pill, or $\frac{1}{8}$ gr. with nux vomica and iron twice a day will give good results. Its use is not followed by constipation, nor is there much necessity for the dose being gradually increased, as with other cathartics. It is of value in *amenorrhœa*, being supposed to excite the uterus from its proximity to the seat of action—the rectum—but for this purpose it should be ordered

with iron about the expected time of the delayed menstrual appearance. In small doses it relieves, but often in large doses aggravates *hæmorrhoids*, and should not be given in pregnancy or inflammatory conditions of the rectum or pelvic organs. The watery extract of Socotrine aloes is the best form for administration, and it is of it that the above doses are given ; its effects are increased by the addition of a bitter.

Aloin should be given in about half the above doses. Sir Andrew Clark's pill for *chronic constipation*, which should be taken before the last meal of the day, consists of $\frac{1}{2}$ gr. each Aloin, Ext. Nux Vomica, Sulphate of Iron, Myrrh, and Soap.

The Compound Decoction of Aloes gives good results in many intestinal complaints, and the writer has found surprising effects from it in obstinate *diarrhœa* in children and adults ; cases having been observed to resist all treatment, both astringent and eliminatory, have yielded to a few 1 to 2 oz. doses, which seem to possess some alterative action on the mucous membrane, often causing in 6 hours a soft solid motion where watery evacuations have been the rule for many days. It is, however, a most unreliable purgative—I oz. occasionally purging at one time and constipating the next.

Alum is an astringent, causing coagulation of albumen and gelatine, and condensation of tissue and diminution of the calibre of the vessels. Externally it is powerfully styptic, and the *dried* powder is an escharotic, destroying *granulations* and *warty growths*. When administered it is carried by the blood, after absorption, astringing the tissues and vessels and diminishing secretion. In this way it controls distant *hæmorrhages*, and is the best remedy in the bleeding of the bowel in *typhoid fever*. In 10 gr. doses it may be given to check the profuse secretion in *bronchitis*, *dysentery*, *diarrhœa*, *leucorrhœa*, and *night-sweats*. In large repeated doses (of 1 dr.) it is emetic, and combined with opium, it *purges* gently in *painters' colic*, and is a remedy of great value in the treatment of *lead poisoning*, and it has been vaunted as one of the myriad specifics for *pertussis*, and for *malaria*.

The most satisfactory effects of alum are seen in its local astringent action ; 4 to 8 grs. in 1 oz. water cure purulent *ophthalmia* of infants, when poured into the eye every hour, unless it is of gonorrhœal origin ; but owing to alum possessing a solvent action on the corneal cement it may cause perforation and should be used with caution, and it should not be used if there is a breach of surface ; $\frac{1}{2}$ oz. to 20 makes a valuable gargle for *relaxed throat*, a lotion for secreting *wounds*, and an injection in *gonorrhœa* and *leucorrhœa*. It has been found beneficial in membranous *croup*, and insufflation of the powder is useful in

chronic catarrh and *nasal discharge*. The glycerine is a valuable local application to *enlarged tonsils*.

R.

Glycerini Aluminis ℥j.

Glycerini Acid. Carbol. ℥iii. *misce.*

Fiat applicatio. *Signa*, "To be brushed twice a day over the enlarged tonsils."

2 drs. Tinct. Iodi may be substituted for the carbolic glycerine.

Ammoniacum—A stimulating expectorant, which has fallen into disuse, but which is of great value in assisting the *aged* and *emphysematous* in getting up with greater ease the tough, viscid secretion of the chronically inflamed mucous membrane. Some of its constituents are excreted by the membrane, depriving the secretion of its adhesiveness. Long experience of its effects in a large infirmary of *aged* invalids convinces the writer that in some way it greatly facilitates expectoration, and assists *wheezing*, in doses of 10 grs. to $\frac{1}{2}$ dr., rubbed into an emulsion with warm water. Larger doses act as a purgative; and externally it is a mild irritant, the plaster often bringing out an eruption on the skin.

Ammonia, when applied externally, is a rubefacient or vesicant. A small blister may be produced in a few minutes by laying a piece of lint, soaked in the strong solution, on the skin, and rapidly covering it with a watch-glass. Its vapour, applied to the conjunctiva and respiratory tract, also acts as a powerful irritant and stimulant, by reflex action raising the blood pressure throughout the body, and is useful in *syncope* and conditions arising from *shock*. Internally, free ammonia, or its carbonate, acts as a powerful, diffusible stimulant, directly exciting the heart, and adding temporary tone to the circulatory and nervous systems; hence, in cases of *sudden depression* and *desperate exhaustion*, a drachm of the dilute liquid, mixed with twice its bulk of water, should be injected into a vein. Its action being the same when thrown into a vein or swallowed, shows that it is not likely that it is neutralised before absorption (perhaps owing to its high diffusive power), and it probably acts directly on the cardiac nerves, and afterwards on the entire nervous system, and is partly eliminated by the bronchial mucous membrane, thinning its viscid secretion. It is converted into urea in the blood.

Rossbach found that a *very weak* solution of ammonia painted over the mucous membrane of the trachea in a living

animal, caused a decided and large injection of the entire surface, and resulted in an increase of the mucous secretion. Strong solutions caused excessive hyperæmia and secretion, and finally a croupous exudation on the surface. Other alkalies produced very different results.

It is also alkaline or antacid, neutralising in the stomach any excessive quantity of acid or irritating gastric juice. It slightly increases but does not diminish the acidity of the urine, and differs from the alkalies—potassium, sodium, and lithium—by first markedly *stimulating the spinal cord* (in poisonous doses) and causing tetanic convulsions. The ammonia salts act as muscle poisons.

It should be injected where there is strong reason for supposing that a *clot of blood* has formed in the heart or any of the great vessels, as it aids its solution.

Carbonate of Ammonium acts like the free gas. It is emetic and purgative in large doses; and in quantities of about 8 grs., diluted freely, acts as a most efficient stimulating expectorant, and general diffusible stimulant, in all prostrating febrile conditions, its administration in *measles* and *scarlatina* being followed sometimes by most satisfactory results, even reducing the temperature. It is just possible it acts by destroying the morbid poison in these cases, as it does in *wasp stings* and *insect bites* when applied locally. It is not admissible in typhoid states with ammoniacal breath. The utility of its injection in *snake bites* is doubtful.

Brewer states that the action of the carbonate depends upon the absorption of the nascent ammonia given off when the acid gastric juice is in the act of combining with the salt in the stomach, and he found that the cardiac muscle was much stimulated, the heart continuing to beat hours after its removal from the body. This latter fact suggests the value of injections of ammonia in poisoning by chloroform.

Richardson has demonstrated that ammonia is a powerful antiseptic, and it has been proved that the vapour will prevent putrefaction in animal tissues for several months.

Acetate of Ammonium Solution, or spirit of Mindererus, acts, after absorption, upon the skin, causing profuse diaphoresis, and is especially useful in all the *feverish conditions* of childhood. Its action will concentrate upon the kidneys if the patient's skin be kept cool. It possesses the curious power, in wine-glassful doses, of counteracting the immediate effects of *drunkenness*, or, in emergency, a tea-spoonful of the carbonate in a glass of vinegar acts equally well.

A mixture containing 2 oz. of acetate of ammonium solution, 2 drs. of acetate of potassium, 4 drs. of spirit of nitre and camphor water, with a little syrup, to 8 oz., affords the most

satisfactory and harmless diaphoretic, or febrifuge combination, in passing *febrile conditions*, or while awaiting a definite diagnosis in the more serious feverish states. The solution of the citrate has the same action. The following will be found a valuable R. in the febrile affections of childhood. (For a child 1 to 2 years old):—

R. *Aquæ Ammoniacæ Acet.* ℥iv.
 Spt. Ætheris Nitrosi ℥ii.
 Syrupi Croci ℥vii.
 Aquæ Chloroformi ad ℥iij. *misce.*

Fiat mist. capt. cochl. min. secundis horis.

Benzoate of Ammonium is a diuretic, acting like benzoic acid and, like it, passing out as hippuric acid in the urine. It is more active than the acid. Dose—10 to 20 grs. in water.

Bromide of Ammonium resembles the corresponding potassium salt in action. (See under Bromum). It is useful in *whooping-cough*, adding to its antispasmodic an expectorant action, and possessing sedative influence over the mucous membrane of the pharynx and larynx. The writer has found it in hospital practice the best routine remedy for this disorder in children, combined with expectorants, like hippo and squill. It must, however, be given freely; a child one year old may get 3 grs., or in bad cases it may be pushed till drowsiness and marked sedative effects are produced. Da Costa urges its use in acute *rheumatism*.

Chloride of Ammonium is a useful expectorant when taken internally, and is most valuable when sucked in the mouth in small pieces, or, more elegantly, in tablets, one of which, placed in the hollow above the last upper molar between the cheek and the gum, where it will take above an hour sometimes to dissolve, will be followed by a free, painless, and often silent expectoration of mucus and checking of the cough. It often permits the subjects of *bronchial irritation* to freely expose themselves to the cold, damp, and even foggy atmosphere of a severe winter.

The writer proposes the term Ciliary Excitants for remedies which appear to have this effect upon the expectoration.

In *catarrh*, after the acute stage, they will be found very useful, and they run no risk of upsetting the digestion. It becomes a difficult question as to the way in which these substances act. One thing, however, is certain, that it is not by absorption, since the same effect, though in a *much less* degree, may sometimes be produced by sucking substances absolutely

insoluble, as bits of glass, rubber, &c., and some of the soluble remedies produce no effect when swallowed in mixtures even in large doses ; so that one is forced to the conclusion that they act by reflex action. Two conditions appear necessary to produce a *decided* effect upon the secretion, viz.—the substance should be *soluble* in the fluids of the mouth, and should produce an impression upon the nerves of taste different from that continually being caused by food. Sugar, for instance, will not affect the secretion, but, if flavoured with an essential oil, it appears to possess some power.

The impression produced upon the terminal filaments of the glosso-pharyngeal, or the lingual branch of the fifth nerve is conveyed to the centre in the medulla, whence it probably is communicated by branches of the vagus, or through the sympathetic system to the mucous membrane, or bronchus, in which it may effect nutritive, secretory, or motor changes.

As will be explained in speaking of some expectorants, the probability of any remedy acting as an expectorant, and increasing the quantity of bronchial secretion without influencing the cilia is slight. The cilia are parts of the same cell, the office of which is to secrete the mucus, and it is hardly in keeping with our present knowledge to suppose that the functional activity of the cells would be increased without influencing their prolongations—the cilia—even though the process of secretion should end in the death of the cell.

Chloride of Ammonium was found by Anstie to be useful in *neuralgia*, and to cut short the course of *migraine* attacks, in doses of 20 grains. Murchison employed it in *chronic hepatic congestion*, and Surgeon-General Stewart, who first directed attention to its value in hepatic congestion, recently again reports that in 20 gr. doses it always induces free diaphoresis, increases the flow of urine, diminishes portal congestion by depleting the congested abdominal viscera, and relieves hepatic pain. It has been used to relieve the vomiting in malignant disease of the stomach and as an alterative in chronic *rheumatism* and *sciatica*.

Various forms of Chloride of Ammonium inhalers, in which the nascent salt is brought into contact with the diseased spot, are used in throat affections.

Phosphate of Ammonium is a diuretic, and is said to decompose the insoluble urate of sodium in the blood, forming urate of ammonium and phosphate of sodium, and is highly recommended in cases of *uric acid diathesis*.

Spirit of Ammonia (Aromatic) and *Aqua Ammoniacæ* afford, the former especially, agreeable methods of administering ammonia. They should be always freely diluted.

Ammonia acts as a caustic or irritant poison when swallowed, the free gas causing serious laryngeal trouble (possibly requiring tracheotomy), and violent gastric irritation, forbidding the use of the stomach-pump.

Amygdala—the sweet almond—is sometimes used in medicine on account of its mild, demulcent effect when directly applied to irritated mucous membranes, but it is, however, chiefly employed as an agreeable vehicle for more potent remedies, or made into bread as a food for *diabetics*. The oil *expressed* from either variety is a bland, soothing application in *inflammatory skin affections*.

Bitter Almonds are more active, containing, in addition to emulsin, which is also found in the sweet variety, a principle called amygdalin. These two substances, when brought together in presence of water, act upon each other, the amygdalin splitting into two new bodies—Prussic acid and volatile oil of almonds—the former of which, being a deadly poison, accounts for deaths after eating bitter almonds; and it explains the action of a lotion of bitter almond emulsion in stopping the itch of various skin affections.

Amyl Nitris—When 2 to 5 minims of this drug are inhaled a surprisingly rapid effect is produced upon the heart and arteries; the pulse is quickened, or sometimes doubled, the arteries dilate, the carotid throbs, and the face flushes, and there is great general relaxation of the arterioles, with diminished blood pressure. If the dose be increased there are signs of paralysis of the motor and sensory centres in the *spinal cord*, the quickened heart and respiration become slower, and may finally cease from paralysis; tetanic cerebral convulsions occasionally arise, the temperature falls, and the blood pressure becomes *nil*. The blood in cases of poisoning assumes a characteristic chocolate colour from the formation of methæmoglobin, which is deoxidised with greater difficulty than hæmoglobin itself. The dilatation of the arterioles is caused by either paralysis of their muscular coats or of the local vasomotor ganglia.

Brunton *anticipated* its efficacy in *Angina Pectoris*, in which disease it has proved a blessing, lessening, when a few drops are inhaled, the arterial spasm, and in the great majority of cases producing relief from the agony of the attack. The capsules introduced and prepared by Martindale, and covered with silk, into which the amyl escapes when the capsule is broken between the thumb and fingers, afford the safest, most elegant, and rapid means for the administration of the drug. The dose by inhalation is larger than if swallowed.

It has been used with success in *epilepsy* while the attack is coming on, in *asthma*, *neuralgia*, *eclampsia*, *migraine*, and *sea*

sickness. It has been used to combat the heart failure in impending death under the influence of chloroform. Through its action upon the cord, it diminishes reflex excitability, and in the case of animals, sugar appears in the urine.

It increases the elimination of uric acid in the urine, and has been used in *gout* with benefit.

Amylum—Starch—is nutritious ; but it is for its bland, un-irritating qualities, when applied externally or in enema, that it has been used in medicine. The powder dusted over *erysipelatous* or *excoriated surfaces* acts as a soothing coating, shielding the part from the action of the air or irritating secretions. Occasionally the preparation with glycerine irritates the skin. Starch is an antidote for iodine.

Anethum and Anisum—Dill, Anise, Coriander, Fennel, and Caraway are identical in action. They are powerful antiseptics. They are in large doses general stimulants, and are used in medicine as carminatives to relieve the *gripping of purgatives*, and the pain of *colic*, and *flatus* in children, for which purpose anise is most used. They probably act in these latter cases as antispasmodics by reflex action ; in small doses they increase the secretion of gastric juice, and all possess feeble expectorant powers by stimulating the respiratory membrane during elimination by the breath. In full doses anise has weak narcotic powers.

Anthemidis Flores—Chamomile—is a stomachic bitter, improving the appetite, and indirectly aiding digestion by increasing the vascularity of the gastric mucous membrane ; in larger doses, especially if warm, the infusion is *emetic*. Its chief use is in *atonic dyspepsia*. Externally, a warm fomentation is a popular remedy in the early stage of inflammations and sprains. The oil is a general stimulant and antispasmodic in 5 minim doses. It diminishes reflex excitability, and has been found useful in *sick headache*.

Antimonium—The tartrate is the salt generally used in medicine on account of its greater solubility and activity.

Externally, it reddens the skin, and brings out an eruption of pustules somewhat like *smallpox*. Its counter-irritant action is uncertain, and liable to be followed by scars.

In large doses it is a violent irritant poison, producing vomiting, inflammation of the digestive tract, finally great prostration and paralysis of the motor and sensory nerves from its direct action on the *cord*. The heart is paralysed, the arterial pressure falls finally to *nil*, and the body heat and the respiration become reduced.

In medicinal doses its action varies with the quantity administered. In $\frac{1}{4}$ gr. doses it slightly reduces the force of the pulse by

its direct effect upon the heart, and acts as a diaphoretic, causing free perspiration, probably by affecting the nerve supply of the sweat glands, and it increases the secretion of the bronchial mucus. The latter effect is one of the most important of the drug, and places it in the first rank of true expectorants. It would appear that the same change occurs in the mucous membrane, as is seen in the skin, and this is especially likely, as we know that the gastric and intestinal mucous secretions are likewise increased. It may thus be said, as Sir Andrew Clark puts it, to cause the bronchial surface to sweat. In slightly larger doses— $\frac{1}{4}$ to $\frac{1}{2}$ gr.—nausea is excited and the heart's action is diminished, antimony acting as a cardiac sedative; the pulse gets soft and weak, arterial tension is lowered, and general relaxation of all muscular structures supervenes; and if the dose is repeated, or one dose of 1 to 3 grs. is given, active vomiting takes place, with great depression and intensification of the former mentioned effects.

Its emetic action follows either after it is swallowed or injected into a vein, and experiment shows that it acts by *directly* influencing the vomiting centre, and also by irritating the *terminal filaments* of the pneumogastric and exciting *reflex action*. If introduced into the stomach, a much *smaller* dose of the drug will produce vomiting than if injected into a vein; this goes to prove that its local action is more important in emesis than its effects upon the vomiting centre. It is eliminated by the glands of the stomach, intestines, and bronchi, and the urine and bile, and affects the cells in the skin like arsenic when given in poisonous doses to frogs, only its action extends deeper than that of arsenic. Such, then, is the *physiological* action of tartar emetic; its *therapeutic action*, or the effects which it produces in diseased conditions, can be for the most part anticipated from this. Thus, in febrile conditions, with a hot, dry skin, its diaphoretic action will be called to our aid; in bronchial affections, with tenacious adhesive secretion, it produces great benefit; whilst in acute inflammations like *pneumonia* and *pleuritis*, with high, bounding pulse, great fever, and vascular excitement, it is simply invaluable, from its cardiac sedative action.

In acute inflammatory affections of the respiratory tract, especially in *croup* and *laryngeal spasmodic diseases*, it is our sheet anchor, allaying spasm, reducing fever, and directly cutting short the progress of the disease. It is called an antiphlogistic from this power of combating *acute inflammations* of a sthenic type, and it is probable that its action in such cases is only what can be accounted for by its effects upon the heart's force and frequency, and the diminution in the respiratory movements and vascular tension.

In the violent delirium of *fevers*, Graves employed it in $\frac{1}{4}$ gr. doses with great benefit, combined with as much opium, every hour or two. In *delirium tremens*, when opium failed totally to produce any sleep, the writer has seen it speedily act when $\frac{1}{4}$ to $\frac{1}{2}$ gr. of this salt was added.

In the *acute bronchial affections of childhood*, antimony continues to be the best remedy we possess. Combined with hippo, or given alone, in the form of the wine, $\frac{1}{2}$ to 1 tea-spoonful is an emetic for a child 1 year old, and 5 minims every hour afterwards keep up the expectorant effect; but the dose can be easily regulated by keeping the little patient on the borderland of vomiting. Owing to the slowness of its action and the great prostration which follows, it is not indicated in poisoning.

Tartar emetic was formerly employed to produce muscular relaxation in *dislocations* and *hernia*, a practice which has melted away before the advance of chloroform. It is still used in *rigidity of the os*, and is valuable in *acute synovitis*. Great tolerance of the drug may be observed in feverish conditions, probably owing to the toxic effect of the poison (causing the *fever*) on the nerve centres.

Antimonial or James's Powder, the active principle of which is oxide of antimony, possesses most of the properties of the tartrate in a feeble degree. It is used in 5 gr. doses in febrile conditions, for its mild diaphoretic qualities.

Chloride of Antimony is a powerful caustic and corrosive liquid, only used externally.

Sulphurated Antimony possesses all the powers of the tartrate, only in a less degree. It has *alterative* properties, which have gained for it some reputation in *syphilis*, when given with calomel in Plummer's pill. It is most uncertain in action on account of its insolubility.

Apomorphine possesses none of the narcotic properties of morphine. When given by mouth or injected hypodermically it produces vomiting, and much less is required by this latter method than if administered in the ordinary way. It acts like tartar emetic *directly* upon the vomiting centre, and *reflexly* through the peripheral gastric filaments, but it is much more rapid, and its action is not followed by nausea or prostration as tartar emetic is, hence it is the most efficacious emetic known in cases of poisoning. Since a *very much smaller* dose acts by hypodermic injection, it is certain that the emetic action of the drug is almost entirely depending upon its effects on the vomiting centre. It stimulates and then paralyzes the motor, cardiac, and respiratory centres and muscular fibre, without affecting motor or sensory nerves.

Apomorphine is simply invaluable as an expectorant. Rossbach, by exposing the interior of the trachea in a living animal, and watching the effect of various substances, studied the action of expectorant remedies from an entirely original point of view. He found that *emetine*, *apomorphine*, and *pilocarpine* produced a rapid and profuse pouring out of mucous secretion, which, especially in the case of the latter drug, was most abundant and liquid, and filled the tubes almost to suffocation. He demonstrated that, contrary to the accepted opinion, this great *hypersecretion* was not preceded or accompanied by *hyperæmia* of the membrane; these drugs were proved by a severance of all the laryngeal nerves, and by a ligaturing of the trachea itself, to act in no *centric* or *indirect* way, but to exert their influence by *acting directly upon the peripheral endings* of the gland-nerves or minute ganglia.

Apomorphine was found to give rather better results than *emetine*, while the constitutional effects of *pilocarpine* prevented its use as an expectorant.

Professor Rossbach states that these drugs are the prototype for expectorating patients, especially in *chronic inflammations* accompanied with dryness of the mucous membrane, wrongly called *catarrhs*, and also in *acute catarrhs* attended with very *viscid secretion*.

In the *bronchitis* and *croup* of children he convinced himself of the excellent and life-saving action of apomorphine.

He says that "it is only since I learned the excellent effects of apomorphine that I can say I really like to treat catarrhs, even of the most obstinate kind, and no longer, as before, approach the case with a sense of therapeutic powerlessness."

The writer has now used it very extensively since 1881, and can speak of it quite as strongly as the above. He has used it alone and also combined with morphia, and finds it the only drug of real value in dealing with some forms of *bronchial irritation*, caused by the inhalation of flax-dust, in operatives employed in the manufacture of linen, whilst it afforded the best results in ordinary *dry catarrhs*, and especially in *asthma*. It must be, however, used with caution, from its risk of depressing the heart and possibly causing œdema of the lung. $\frac{1}{8}$ gr. every 3 or 4 hours in camphor water, with or without morphia or ipecacuanha, may be given. Murrell has given 1 gr. 3 or 4 times daily without nausea resulting.

A 1 per cent. solution freely dropped into the eye will cause anæsthesia like cocaine.

Aqua—The effects of water as a remedy depend entirely upon the form of its exhibition, and this is so varied that only a very few of its actions can be noticed here.

Internally, water is of great use in fever, in the form of ice, a bit of which sucked in the mouth allays thirst by reflex action. It also, probably by reflex action, stimulates feebly the cerebral circulation; and it may increase the quantity of gastric juice before being swallowed. In *ulcers* and *irritable conditions of the stomach* it soothes by diminishing sensation, while it checks hæmorrhage by contracting the muscular tissue of the ulcerated artery.

In $\frac{1}{2}$ to 1 pint doses, cold water before food in the morning acts as a mild cathartic, by adding water to the fæces, which it probably does by being alternately absorbed and eliminated again as it passes down the canal, stimulating the intestinal glands. Introduced into the rectum as an enema, water washes out the colon, and is the safest remedy in impacted accumulations; but to be administered properly, it should be given at about 98°, slowly injected, with the patient lying on the left side. From 3 to 8 pints can be used with safety, if not jerked up; and benefit will be found by turning the patient over gently on his right side, or on his hands and knees, or by raising the pelvis, so that the fluid gravitates along the colon to the valve, the operator pausing from time to time to allow the temporary pain or spasm to subside.

Of a different class are enemata of cold water, or of water containing castor oil, turpentine, soap, &c. Here the intention is to excite reflex contraction, which one endeavours to avoid in the former case, and a pint or two will be enough. Still more different are nutrient enemata, which are intended to be absorbed. They should not be more than the bulk of a few ounces, and should be of the consistence of thin arrowroot. The addition of a little laudanum assists in their retention till digestion and absorption occur.

Water, when taken in large quantity, acts as a diuretic, by washing out the kidneys and bladder, and copious draughts of warm water are emetic.

Externally, water is largely used in medicine, and its mode of action depends upon its temperature and the method of application. Bartholow states that on immersing one hand in cold water a corresponding reduction of temperature occurs in the other hand, and infers that changes in a similar way occur internally.

On immersing the body in cold or tepid water, refrigeration occurs from the actual loss of animal heat, water acting as a good conductor; the vessels of the skin are caused to contract, and in the warm bath they relax. The hot bath at first acts as a powerful stimulant, but, if indulged in for too long a period, the heat of the body causes cardiac weakness, and prostration and

fainting follow. The hot and warm baths, acting so thoroughly on the skin and increasing its secretion, are used to cause excretion of water and urea in *dropsies*.

Ice is largely used in surgical practice as an application to inflamed parts, as in *orchitis*, *hernia*, *head affections*, &c., acting as a sedative, diminishing the amount of blood in the part, both by direct and reflex action ; and water, iced, tepid, and cold, is used for dressing and irrigating wounds.

The following are the most common forms in which water is used externally as a remedial measure :—

The *Cold Bath*, which is water about the temperature of the air, or on an average of between 45° and 60°F., is used in *fevers*, and as a tonic in various diseases of the nervous system, and for its anaphrodisiac effect.

The *Tepid Bath* is water about 85° to 95°, also used in fevers.

The *Warm Bath* is water about 98° to 100°, and the *Hot bath* is water at 103° to 108°, used in *dropsies*, *kidney diseases*, *catarrh*, &c., while in the *Turkish Bath* various apartments are heated from 100° to 200°F. It is used in *secondary syphilis*, *rheumatism*, &c.

The *Sitz* resembles the *hip bath*, being a vessel in which the pelvis and hips can be immersed in water at any temperature, the remainder of the body being free. It is used in the sitting posture, chiefly by female patients, for *uterine ailments*, *amenorrhœa*, &c.

The *Sponge Bath* is a shallow vessel, generally of cold water, in which the patient sits or stands while the surface of the body is sponged freely over.

The *Douche* is a sudden application with force, of a stream of water (generally cold) to the surface of the body ; an invaluable remedy in the *coma of alcohol*, *sunstroke*, &c. It differs from the *shower bath*, which is the impaction of a multitude of drops, or minute streams, from a height, and from *cold affusion*, which is the pouring of a liberal volume of cold water over the surface of the body, as in *fevers*, *alcoholism*, and *laryngismus*.

The *Wet-Pack*, so much used in hydropathy, consists in enveloping the body in a linen sheet wrung out of cold water, and spread flat upon a hard mattress, upon which the patient reclines, the ends of the sheet being carefully tucked in on each side, and the feet completely covered, after which several blankets are placed upon the top of the sheet. A piece of Mackintosh sheeting is generally interposed between the wet sheets and the blankets. The pack lasts half an hour or more, and is followed up by friction with dry towels.

The *Hot Wet-Pack* is managed in a similar way with hot water, and resembles the various *steam* baths used in dropsies, and which may be made by boiling water with a spirit lamp

under a cane-bottomed chair, upon which the patient sits, surrounded completely, except the head, by a blanket.

The *Mustard Pack* is managed like the *Hot pack* by infusing a handful of powdered mustard in the hot water in which the sheet is immersed.

Sir J. Simpson's poor man's bath is made by filling 6 or 8 soda water bottles with hot water, drawing over each a stocking squeezed out of hot water, and placing them alongside the patient under the bed-clothes. They make a good bath in about 30 minutes.

The *Hot-air Bath* is made in a similar manner by burning a spirit-lamp under a chair, or by introducing under the bedclothes any of the spirit lamps made for the purpose. These latter are invaluable in *Bright's disease*.

Fomentations are merely local baths, or circumscribed hot packs, in which medicinal substances are generally introduced.

Cataplasms are similar applications of a semi-solid consistence, composed of various medicated ingredients.

It is in the treatment of *hyperpyrexia* where the temperature of the body rises to 106° or 108° and remains so, death being almost certain in such cases if let alone, that the judicious application of cold water saves life—as in *typhus*, and more especially in *rheumatic fever*. The patient is placed in a bath of above 98° , and cold water or ice is added till the bath cools to 70° , 60° , or even 50° F., watching the temperature of the patient, as indicated in the rectum. When a fall of 3 to 5 or more degrees occurs, he is removed, wiped dry, and put to bed, where the temperature continues to fall for half an hour or more. The time in the bath varies from 5 minutes to 2 hours, and it may be repeated every 2, 3, or 4 hours (if necessary) when the case is severe.

Water at a temperature of 112° effectually checks *uterine hæmorrhage*, when injected into that organ.

Aquapuncture, or the injection of water by the ordinary hypodermic needle under the skin, or into the substance of muscles, is often followed by surprising results. Its action depends upon its nutritive effect on the nerves of the part, for pain in a superficial nerve is often at once alleviated, and it will produce this effect without causing any irritation around the puncture. Bartholow has derived good results from the injection of water into the substance of paralysed muscles.

For superficial pain 30 minims should be injected at the pained spot and frequently repeated—5 times within an hour if necessary.

Argenti Nitras coagulates albumen and is a powerful corrosive poison, and when applied externally, either in the form of solid stick or mitigated caustic, it destroys the tissues, and is

used to paint over exuberant granulations, its destructive effects being followed soon by an *altered action* of the parts, a result which is utilised in many chronic unhealthy inflammations, as in *cystitis* and *gonorrhœa* (1 gr. to 1 oz.), *conjunctivitis* (10 grs. to 1 oz.), *ulcers* (30 grs. to 1 oz.), and *relaxed pharyngeal catarrhs* (20 grs. to 1 oz.). It destroys *tinea*, *warts*, and *chancres*; and the *poisons of rabid animals and snakes*, if applied in time.

Carter, in *ophthalmia*, introduces a cocaine disc into the eye, and in 10 minutes applies with a *fine* camel's-hair pencil a small quantity of a (5 to 10 grs. to 1 oz.) solution of the nitrate, confining its action, if necessary, to the region of the ulcers. With a larger brush *ophthalmia neonatorum* may be painlessly treated. Cr  de's method of preventing this latter disease is to drop in a 2 per cent. solution after birth.

Internally, nitrate of silver acts in large doses as other corrosive poisons, causing inflammation and destruction of the gastrointestinal mucous membrane. In addition, however, it causes marked *nervous* symptoms, as *paralysis*, *spinal convulsions*, *dyspnœa*, &c., from its action upon the centres. It has been successfully used in large doses ($\frac{1}{4}$ to 2 grs.) in *ulcer of the stomach*, with the view to cauterise or alter the character of the process going on in and around the ulcer, its use being not free from danger. In solution it has been recommended as an injection in ulceration of the rectum and colon. In *dyspepsia* and *vomiting of yeasty fluid* it often acts most beneficially. As it coagulates albumen, it possesses astringent qualities, and hence is used in *diarrhœa* depending upon ulceration; and its effect upon the gastric nerves, in doses of 1 gr., in bread-crumbs pills, is sedative. It prevents *spasm*, and is useful in *epilepsy*; but owing to the discoloration of the skin following its prolonged use, it is seldom employed. It has been given in *chronic affections of the spinal cord*, in *paraplegia*, and *locomotor ataxy*. When it reaches the stomach it is precipitated by the chlorides abounding in the gastric juice, and likewise when applied to a moist surface it whitens it, owing to a film of the chloride being formed, which is afterwards changed into the black oxide.

It has been recently recommended in *purpura*, and the writer has seen striking results in two cases from $\frac{1}{4}$ gr. doses three times a day.

Rx. *Argenti Nitratis* gr. iv.

Micæ Panis (sine Sodii Chlor.) gr. xxx.

misce.

Fiat massula et divide in pilulas xvi., st. i. ter in die, ante cibos.

Argenti Oxidum resembles closely the nitrate, except in its external effects. It is less irritating, and has been used in 1 gr. doses in *gastrodynia* and for its astringent properties in hæmorrhages, especially *menorrhagia*, and for its alterative effects upon the nerve centres, in *epilepsy*, *ataxia*, &c.

Armoracia—Horse-radish Root—when chewed, acts as a stimulant to the salivary glands, increasing their secretion—hence it is a Sialagogue. When swallowed, it increases the gastric secretion, acting as a stomachic, and after absorption it is thrown out by the kidneys, stimulating these organs in its passage—thus it is a true Diuretic. The secretion of the skin is also increased. When applied externally it is a Rubefacient, causing redness, like mustard, only less in degree.

Arnica—Externally applied, preparations of the root or flowers cause irritation of the skin, which may take on serious or even fatal inflammatory action, extending to distant parts, and stimulating erysipelas or gout. Its use is contra-indicated whenever the skin is broken. $\frac{1}{2}$ oz. of the tincture to 1 pint water is strong enough for ordinary use. Diluted, these preparations are said to act in such a way as to cause absorption of extravasated blood, by their effect on the absorbents of the skin; hence they are applied to *sprains* and *bruises*—most of the benefit, however, may be justly ascribed to the spirit generally used along with them. Internally, arnica has been credited with many fancied virtues. It acts as an irritant to the stomach and gullet, and produces diarrhœa, and in large doses diminishes, like aconite, the respiratory and circulatory functions; it has been recommended in *fevers*, and in *delirium tremens*. It produces in poisonous doses marked nervous prostration, muscular weakness, spasmodic movements of the limbs, and collapse. It is at best an uncertain and often a dangerous remedy, and is justly falling into disuse.

Arsenic (See Acid. Arseniosum.)

Asafoetida, after absorption, acts as a stimulating expectorant, closely resembling the onion in its power of increasing the secretion of mucus from the air passages, probably during its excretion by this channel; and it either blunts the sensibility of the respiratory centre, diminishing the breathlessness of *emphysema*, or, by diminishing the flatus in the digestive tube, it gives more room to the easily overburdened lungs. It is, however, in *hysterical* ailments that it is chiefly employed, controlling the irregular and erratic nervous phenomena seen in that disease, as some suppose, by the moral influence of its disgusting and intolerable odour.

It acts as a mild purgative, and is very beneficial as an enema in *flatulent colic*. The best preparation is the Fetid Spirit of Ammonia, in $\frac{1}{2}$ dr. doses.

Atropine and Belladonna when applied locally act as anodynes by lessening the sensibility of the sensory nerves. Small doses cause dryness and redness of the throat and mouth, dilated pupils and disordered vision, and sometimes a peculiar scarlet eruption. By stimulating the nerve centres, a large dose produces active brain excitement, with pleasing delirium, hallucinations, illusions, a feeling of lassitude, and eventually sleep, whilst at the same time there is paralysis of the peripheral motor nerves. The heart becomes excited and the vascular system stimulated (standing 12 feet from a patient the writer has heard the heart sounds) ; this stimulation is probably caused by the action of the atropine upon the minute inhibitory ganglia contained in the cardiac muscle, and not upon the terminals of the vagus. Ultimately the heart is paralysed ; the small vessels contract, and the arterial tension is at first raised and afterwards diminished, the secretion of saliva, bronchial mucus, and sweat is stopped. At first there is forcible expulsion of urine, but soon the bladder becomes partially paralysed, the urine and urea increased, and the pupil widely dilated.

The respiratory and vaso-motor centres are stimulated by full doses, but paralysed by poisonous doses.

When dropped into the eye atropine causes marked dilatation of the pupil by paralysing the filaments of the third nerve supplying the sphincter muscle of the iris. *The action is entirely a local one.* From the force with which this dilatation takes place, sometimes tearing and lacerating the iris, if adherent, it is evident that there is *stimulation of the dilator muscle* which receives its nerve fibres from the sympathetic ; this is further proved by section of this nerve. In a former edition of this work the writer contended that the mere paralysis of the sphincter was quite enough to act as a stimulus to the opposing dilator without any necessary effect of the atropine upon the sympathetic, as Harley believes. There is also marked loss of accommodation, resulting from paralysis of the ciliary muscle, which fails by loss of tension to act upon the suspensory ligament, so as to cause the lens to become more spherical ; the eye is consequently focussed for distant objects.

Atropine causes mydriasis when given internally, by being carried in the blood to the eye itself, and there acting precisely as when applied locally.

Brown-Séquard recommended belladonna with the intention of contracting the small vessels supplying diseased tracts of the nervous system, as in certain forms of *spinal paralysis*, and for a similar reason it has been employed in various *inflammations*. From its power of stopping the secretion of the mamma and skin, it is invaluable in checking *sweating* in phthisis, and preventing *inflammation of the breast* after weaning.

in both of which cases it may be administered internally and applied externally. In *small* doses it increases the action of purgatives, by weakening the inhibitory fibres of the splanchnic. It is recommended on this account in *obstruction of the bowels*, *impacted gall-stones*, *renal calculi*, and *asthma*. Harley recommends it in *kidney affections*, where he pointed out its use in directly diminishing the congestion by contracting the small vessels. *Acne* of recent origin is said to yield speedily to small doses of belladonna.

As a *diuretic* it increases the urea in diseases threatening suppression of urine. It has a powerful effect in stopping the bronchial secretion, and has been given for the *profuse expectoration of bronchitis*. In the hands of some physicians it has been found to relieve cough and spasm of the bronchial tubes. This has not been the writer's experience, nor has he found it of benefit combined with digitalis in cardiac weakness. Old people are affected sometimes by most minute doses. From its anodyne action it is beneficial in *neuralgia*, and Anstie advocated its use in *lumbago*, *sciatica*, and *neuralgia of the pelvic organs*. Pushed almost to the extent of showing its poisonous effects, it is curative in *whooping-cough*, and children bear very large doses. It is by far the best remedy in *incontinence of urine* in children, probably by its partially paralysing the muscular coat of the bladder. It is excreted in the urine. According to Hausmann the hypodermic injection of $\frac{1}{150}$ gr. will control *hæmoptysis* when ergot and all other remedies fail.

Belladonna and atropine are used as antidotes in opium poisoning. The addition of $\frac{1}{2}$ or 1 minim of Atropine solution to each hypodermic dose of morphia is a wise routine practice.

(For nocturnal incontinence in a child 5 years old.)

R. *Tincturæ Belladonnæ* ℥iv.

Syrupi Limonis ℥iv.

Aquæ (or Aquam) ad ℥vi. *misce.*

Fiat mistura, cujus capiat ℥j. ter in die et hora somni.

Externally, it is used on account of its anodyne properties to relieve pain in *neuralgia* or to arrest the *suppurative process* in boils; and the plaster, in addition to relieving pain, acts by putting the region to which it is applied to some degree on the same footing as an *internal part*; hence its value as a strapping for *enlarged glands* and *superficial joint affections*. It is useful in the form of plaster when worn over an irritable and pained heart. It should be remembered that Belladonna is freely absorbed by the unbroken skin.

Squire's Chloroform of Belladonna made by percolating the root with chloroform (1 in 1) is a powerful anodyne application.

Aurantii Cortex is a mild bitter tonic, acting on the stomach in such a way as to give it increased tone, and it feebly stimulates the appetite. It is for its flavour, which is aromatic and pleasant, that it is used in medicine.

Aurantii Flores are only used for their agreeable perfume and flavour, though supposed to possess hypnotic qualities.

Balsams of Peru and Tolu—These substances are of little therapeutic power; they act as stimulating expectorants, probably because they are eliminated to some extent by the bronchial mucous membrane, and, to a still less extent, by the other mucous surfaces, to which they act as feeble stimulants. Externally, the Peruvian balsam is a mild stimulating application to *sluggish ulcers*, *bed sores*, and *cracked nipples*, in which cases it is often mixed with castor oil in equal quantity. In a similar way it is a valuable parasiticide, and is a good remedy for the *itch* and for *pediculi*.

Baths—(See under Aqua).

Beberinæ Sulphas possesses unstimulating tonic properties; it was introduced as a febrifuge, and has, undoubtedly, anti-periodic power, but so inferior to quinine and arsenic that it is now seldom employed, and the bark (nectandra) from which it is extracted shares the same disrepute.

Belæ Fructus—There is much diversity of opinion about the *astringent* action of this drug, which is so highly prized in India for *dysentery* and *diarrhœa*. It is devoid of tannin, and appears to act as a laxative in health and as an astringent in diarrhœa. The drug varies much in its action, owing probably to the variations in the degrees of its ripeness before being collected.

Belladonna—(See Atropine).

Benzoinum—A stimulating expectorant, acting, probably, on the relaxed bronchial mucous membrane, by which some of its volatile constituents are eliminated. It possesses all the properties of its active principle, Acid. Benzoic. (which see). The compound tincture, or friar's balsam, is an invaluable antiseptic stimulating application to *ulcers and sores*, and is the best remedy for healing *tortuous sinuses* and *sinuous scrofulous tracts*, and injected (undiluted) with a fine syringe, it decomposes *fetid* secretions, and establishes healthy action in these troublesome affections. It is a valuable hæmostatic when applied to fresh *wounds*.

Containing benzoin, storax, and tolu, it is highly spoken of by Yeo, who has found it of great service in lessening the secretion and cough in *chronic bronchitis*; it may be prescribed with mucilage or tragacanth. (See page 35).

The vapour of the tincture has been found to cut short attacks of *catarrh* and *influenza* in a surprising way, it is said, even when inhaled directly from the bottle containing it.

Bismuthum—The preparations of bismuth act, when swallowed, as direct sedatives, by coming in contact with the excoriated or irritated filaments of the nerves supplied to the mucous membrane of the stomach. The insoluble salts were held to pass through the alimentary canal, but Wood has demonstrated that bismuth can be easily detected in the urine shortly after their administration, and there is not a doubt but some portion is absorbed. The residue blackens the motions like iron. Whether the sedative action on the gastric nerves is owing to mere mechanical shielding of them from irritating secretion, or to some vital change in the nerve ending, induced by contact with the bismuth, we do not know; but ample clinical experience has proved the great value of these salts in all *painful gastric* affections, and in the cure of *dyspepsia*, *ulcer of the stomach*, and *vomiting* from various causes. They are used also in *diarrhœa* in larger doses (1 dr.), and sometimes as a cosmetic, and as a soothing application to *eczema*, *intertrigo*, &c., and have been used as an injection in *gonorrhœa*, and in *ulceration of the rectum*. The carbonate is the most useful preparation, being antacid, and may be safely combined with opium or morphine. It is also credited with astringent properties, and it is antiseptic; poisoning has been reported from the absorption of the insoluble salts when applied in quantity as a dressing, but as a rule they are innocent in very large doses.

The soluble salts of bismuth, viz., the citrate, and the citrate of ammonium and bismuth, are inferior to the carbonate and nitrate; they may cause irritation of the stomach and aggravation of all the gastric troubles in similar doses to the insoluble salts, but in doses about $\frac{1}{10}$ the amount they have some soothing action on the gastric membrane. The peculiar phosphorus-like odour of the breath observed during a course of bismuth has been shown to be caused by the metal tellurium found in impure preparations.

As an application in irritable conditions of the nasal membrane, "Ferrier's Snuff" is valuable; it consists of Subnitrate of Bismuth 3vj., Morphia Hydrochlorate 2 grs., and Powdered Acacia Gum 3ii. See the R. on page 332 containing bismuth. By the addition of a little morphia it may be used in any painful gastric disease with great benefit.

Borax, when swallowed, is absorbed, and acts in the blood like an alkali or antacid, and passes through the kidneys, which it stimulates, acting thus as a diuretic. It also affects the uterus, which it causes to contract and expel its contents; hence, it has been used to *produce abortion* and to expel a *retained placenta*. Its *emmenagogue* properties, however, are uncertain, and it is for its local action that borax is generally used. Applied to a diseased *mucous membrane*, it soothes pain and diminishes congestion, altering the action of the part. Its action has been in this case described as astringent, but, with our present knowledge, it seems better to confess ignorance, and call it a *local alterative*. Recently, good results have been reported in *epilepsy*, after doses of 10 to 20 grs. thrice daily.

Borax exerts a toxic power over the lower forms of life, and possesses antiseptic properties, but Boracic Acid is selected when we wish to get this effect of borax. (See Acid. Boracic.) Of all the remedies we possess, none equal it for the painful *aphthous condition of the tongue and mouth* so often seen in childhood and infancy, and the glycerine of borax is decidedly superior to the preparation with honey as a basis. A little should be brushed over the child's mouth or smeared on by the nurse's finger several times a day. It is equally useful in *fissures of the tongue* in adults.

Often after exhausting *fevers*, and especially in *pelvic* or *abdominal inflammations*, the mouth assumes an unhealthy aspect, with a raw and sometimes cracked tongue, which causes great distress to the sufferer; here a large crystal of borax, licked continually by the tongue, affords marked relief when all other applications aggravate. It is an invaluable remedy for *ulcerated nipples*, and possesses the advantage of keeping the infant's mouth healthy at the same time. A warm saturated solution applied to the scalp raises a lather like soap, and partially dissolves and effectually removes the dead epithelial scales. A solution of 1 dr. to 4 oz. water makes a useful lotion in *itching* of the labium or anus, and a table-spoonful of the powder, or twice as much of the glycerine in one pint of water, proves valuable in *leucorrhœa* and *abrasions* or unhealthy states of the vagina or os uteri. It is recommended in *mercurial salivation* as a local application.

Bromum is very seldom employed in medicine, except in combination with potassium, or ammonium, or as hydrobromic acid. It has been recommended as a deodoriser and antiseptic, and a weak solution is useful when applied to *sloughing sores*. It is a powerful caustic, and has been used as such in *ulcerations of the neck of the uterus*, but possesses no advantage over other more agreeable and better known remedies. It is an irritant poison.

Bromide of Potassium is a sedative to the nervous system; it is diffusible, and after being swallowed soon enters the blood, whence it is carried to the brain and spinal system of nerves, producing drowsiness and sleep by diminishing the quantity of blood in the cerebrum and lessening reflex excitability in the cord, and cortical motor centres. It produces partial loss of sensation, and diminished reflex irritability in the back of the throat, which may be freely swept round with the finger—after a course of bromide—without exciting efforts to swallow or vomit. The diminished sensibility in the pharynx has been considered to be owing to the local effect of the salt, as it is being eliminated by the mucous membrane of the part. The same effect is produced by the application of a watery solution to the part.

Bromism is the name given to a group of varying symptoms following the prolonged use of the bromides, anæmia, mental dulness, unsteady gait, muscular weakness and prostration, dyspnœa on exertion, loss of sexual power, sleepiness, fetor, and sometimes a smell of bromine from the breath, general diminished tactile sensibility, and eruptions of acne spots about the face and shoulders. Bromide of Potassium is eliminated through the skin, breath, urine, and fæces, appearing as bromide of soda. The bromides of potassium, sodium, and ammonium are almost identical in action, and may be combined, only the latter is of more use in *whooping-cough* and *respiratory spasmodic affections*. Hydrobromic acid is the least objectionable form in which to get the effects of bromides, as its use is not followed by the depressing symptoms seen after the administration of the potash salt, and which are caused by the potassium base.

Therapeutical action.—Bromide of potassium has been used in various *nervous* affections associated with convulsive movements, as in *epilepsy*, it is of greatest value in the worst forms, for the minor epilepsy, or *petit mal*, is often unaffected by it. In these cases the dose should be large—20 to 40 grs. three times a day, or $\frac{1}{2}$ to 1 dr. of the acid—and animal food should be diminished or stopped during the use of the bromide, which should be continued for a long time after all trace of the disease has disappeared. In similar doses it is the safest treatment for *sea sickness*. *Laryngismus*, *whooping-cough*, *asthma*, *delirium tremens* in its first stage, *acute mania*, *migraine*, *vaso-motor changes* (so common at the cessation of menstruation), *menorrhagia*, *nocturnal seminal emissions*, and *priapism*, are all decidedly benefited by the bromides. Its utility in these conditions is to a large extent explained by its power of diminishing reflex action. It appears to have more curative power with the vigorous than in the anæmic; this is particularly true in *neuralgia*.

In *sleeplessness*, arising from prolonged mental labour or worry, the bromide is invaluable. A full dose of 40 grs. at bedtime, repeated in 1 or 2 hours if necessary, produces refreshing sleep so different from that of any other narcotic as to lead one to believe it acts on the brain like natural sleep, which is characterised by anæmia; hence one explanation of its action in *mania* and affections accompanied by symptoms of *congestion of the head*. It sometimes relieves *cerebral vomiting* when other remedies fail, and it stops the *convulsions* of several diseases, as *acute hydrocephalus*, &c., without in any way curing the maladies. Occasionally it has produced good results in some forms of *diabetes*.

It has been used in *tetanus* and *strychnine poisoning*. The bromide of potassium acts as an alterative like the iodide, only much more feebly; and it has been used to reduce *enlargements of glands* and *syphilitic growths* and *hypertrophy of the spleen*, though it should only be given in these cases (owing to its uncertainty) when the iodide cannot be tolerated. Acne follows its use very often, and when it attacks the face is a barrier to its exhibition. This is largely prevented by adding a little arsenic, as in the following formula. The writer has often seen severe erythema nodosum follow its administration, and a host of cutaneous ailments have been attributed to it.

It should not be given in anæmic conditions, and it is worth remembering that it greatly increases the hypnotic effects of chloral, belladonna, opium, and hyoscyamus. The effect of bromide of potassium will be increased by combining it with the bromides of ammonium and sodium.

(For Epilepsy in an Adult).

Rx. *Acid. Hydrobrom. Dil.* ℥ij.
 Sodii Bromidi ℥vj.
 Liquoris Arsenicalis ℥iss.
 Syrupi Aurantii ℥ij.
 Aq. Destillatæ ad ℥xxx. *misce.*

Fiat mistura, cujus capiat semi-unciam ter in die.

Buchu when administered, soon finds its way into the blood; the volatile oil, of which it contains $1\frac{1}{2}$ per cent., circulates in that fluid, and on reaching the kidneys is thrown out, acting in its elimination as a stimulating diuretic. As it comes in contact with the genito-urinary mucous membrane in *chronic cystitis* it acts upon it, either by its own stimulating powers or by altering the previously unhealthy urine, which then becomes

a tonic to the relaxed membrane. It has some action of a similar nature upon the bronchial membrane in *bronchitis*.

Butyl Chloral Hydras possesses properties similar to Chloral Hydrate from which, however, it differs, in being a weaker hypnotic, in producing somewhat less cardiac depression, and in having a specific anodyne or anæsthetic action upon the branches of the fifth nerve.

Liebreich believed that its action on the heart in even fairly large doses was not dangerous, and that the life of a poisoned animal could be saved by artificial respiration after the respiratory muscles had ceased acting, but its administration cannot be conducted with much less caution than that of chloral hydrate.

As regards its power of relieving pain, short of producing sleep, its action is very weak, except in the case of *neuralgia of the fifth nerve*. Ringer finds it very valuable in nearly all neuralgic conditions of the face, occiput, neck, and in *migraine*.

In *neuralgia* the writer begins with 10 grs. for the first dose and 5 grs. every *two* hours for three or four more doses, and then 5 grs. 3 or 4 times daily, and he does not think it safe to exceed this at first.

It has but slight power when applied locally to the carious cavity of a painful tooth, and appears to be of very little use in ordinary toothache. It is best given in form of pill, which can be made to contain 5 grs. of the salt if a *little* mucilage be added. It can also be given in solution in water, with glycerine. The pills should be made fresh.

Cadinum Oleum—Oil of Cade is a local stimulant in scaly skin diseases, acting in the same manner as tar. It is chiefly used in the very chronic stages of inveterate *eczemas* and in *psoriasis*. It may be prescribed in the form of an ointment mixed in all proportions with any firm cerate, or as a liquid combined with an equal amount of soft soap dissolved in alcohol (1 dr. to 1 oz.).

Caffeine in moderately small doses (2 to 3 grains) produces a state of mental activity, wakefulness, and restlessness, by acting as a stimulant to the brain and increasing *all* its functions. If the dose be repeated or increased, flashes of light before the eyes, noises and singing in the ears are experienced, and micturition becomes more frequent, and a state of muscular tremulousness supervenes, and the temperature *rises*; in still larger doses delirium and sleep supervene, followed by tetanic convulsions, and *very large* doses would be required to produce death.

The cardiac and respiratory centres in the medulla are stimulated by medicinal doses, as seen by the increased pulse rate and the rise of blood pressure. This is seen most in the cardiac

muscle, whose contractions are rendered stronger and slower, and, if previously faltering and irregular, become steady and firm by medicinal doses, while *large doses* may cause the healthy heart to act irregularly, just as digitalis does. It is a diuretic, often acting with *promptness*, and may be given in large doses in cardiac dropsy where digitalis fails; it probably stimulates the renal cells as well as raises the blood pressure in the kidney. There are contradictory reports upon its digitalis-like cardiac tonic action in heart disease.

The writer has employed it in *chronic Bright's disease* with advantage, diminishing the albumen and anasarca, and increasing the quantity of urine; but the most careful and painstaking experiments, conducted on three such cases, over a prolonged period, failed to show any constant effect upon the daily elimination of urea. The diet was carefully regulated, the patients kept in bed, and the urine scrupulously collected, and the amount of urea daily calculated for some months. There was apparently a marked gain in weight in each case, and in one the albumen entirely disappeared.

Caffeine in 2 to 5 gr. doses is often efficacious in *migraine* and *unilateral* headaches, in which case the effervescing magnesia with caffeine is a valuable and grateful preparation.

M. Tauret found that caffeine dissolves readily on the addition of salicylates.

Cajuputi Oleum is a powerful diffusible stimulant, and gives better and more definite results than any of the other essential oils. In addition to its antispasmodic powers it has a slight narcotic and anodyne action, a large dose (10 minims) diluted in an emulsion with mucilage and sugar producing effects not unlike those following the exhibition of musk. It will be found useful in the *prostration of low fevers*, *neuralgia*, and *hysteria*.

Tea-spoonful doses of the spirit of cajuput may be given every hour, in a little sherry. A full dose gives great and speedy relief in *colic*, probably stimulating the bowel by direct contact. Externally it is a rubefacient, and may be applied to *painful and diseased joints* where there is much muscular spasm, and it has been used with success in *eczema*, *psoriasis*, and *acne rosacea*.

Calamina is used for its protective action upon *weeping and irritated cutaneous surfaces*; it acts like the oxide of zinc, which see.

Calcium—In most of its forms, in minute doses, lime is a restorative, supplying to the blood an element found in the normal tissues. Its free use, however, like the alkalis, will be found to increase waste by quickening the retrograde metamorphosis of many constituents of the blood and tissues.

Chloride of Calcium is recommended in *scrofula* and *tubercle* in 10 gr. doses. It acts as a restorative, and has been recommended in *rickets* and ailments of defective nutrition, and under its use large glandular tumours have been known to disappear. In large doses it is an irritant poison.

Carbonate of Calcium and *Chalk or Creta Præparata*, are valuable antacids, possessing unirritating astringent powers. They are given when we wish to reach the *intestinal surface* with an alkaline preparation of calcium. Unless the dose is very small the chalk will find its way through the duodenum, the greater part still remaining as carbonate, and passing along the intestines it will neutralise any free acid which it meets with, forming a chloride or lactate; it thus diminishes the free secretion of the bowel, so that costive, hard, or dry motions are the result. We can easily see from this its value in the *diarrhœa* accompanied by acid, acrid evacuations, especially seen in children, generally in hot weather. It is very useful in various *stomach* derangements with acidity, but the liquor calcis is better where we want to reach the first part of the digestive tract, and it is a good rule to order these different remedies in this systematic way—*chalk* for the *intestines* and *lime water* for the *stomach*. The lime preparations being absorbed in a very slight degree, only minute doses of them need be ordered; but where local antacid action is required these salts may be freely administered, though not for a very long period, as they, like magnesia, are liable to form concretions in the bowel. Externally, chalk or the precipitated carbonate is useful, on account of its mild astringent or desiccant properties, when applied to *weeping skin diseases*, especially *intertrigo* about the groins or buttocks of infants, and both are valuable antidotes in *poisoning by the mineral acids*. Sir D. Duckworth uses with good results an ointment of equal parts chalk and benzoated lard in *erysipelas*.

Calx, Calcis Hydras, and Liquor Calcis—Lime, from its great avidity for water, acts when applied to moist tissues as a powerful caustic, though its eschar is very superficial. It is not often used alone, but mixed with potash and moistened before application with a little alcohol, it forms the well-known Vienna Paste used in *uterine ulcerations and cancerous growths*. Slaked lime (lime to which half its weight of water is added) is not used in medicine except to make lime water. When it reaches the stomach it is decomposed into the chloride or lactate, and, as such, some of it finds its way into the blood. It neutralises and checks the excessive activity of the gastric juice, when administered while digestion is going on.

It thus is a valuable antacid, and the residue, if the dose be large, acts as a mild astringent upon the *intestinal mucous membrane*; and, eventually, if the administration be continued, the

urine becomes alkaline, and it may thus be useful in *uric acid gravel* and to dissolve calculi. It is best given in milk, as its taste cannot be detected in that liquid. 2 or 3 oz., mixed with three times as much milk, often soothe the stomach in painful *dyspepsia*, *cancer*, and *gastrodynia*, and stop the vomiting in these ailments. The addition of 1 oz. to 1 pint of cow's milk prevents the formation of curdy masses, and stops *infantile vomiting* depending on this cause. Lime water makes a good injection in *leucorrhœa*, *otorrhœa*, and *gonorrhœa*.

Applied externally, lime water is a mild astringent to moist *eczema*, &c. ; mixed with equal parts of olive oil it forms a rich creamy emulsion, or with linseed oil, it makes the popular Carron oil, so soothing to *burns* and *scalds*, and which may be improved greatly by the addition of 1 or 2 per cent. of carbolic acid ; and is useful when applied to *cracked nipples*.

The saccharated solution of lime possesses the same properties as lime water, only it is about 14 times stronger.

Calcii Phosphas is of importance as a food and constituent of the body, and is present in excess wherever cell formation is active. Beneké has found it very useful in the diseases in which it appears in excess in the urine, but it does not act simply as a *restorative*, for in *rickets*, *mollities ossium*, and other lesions of *mal-nutrition*, the phosphates of lime may load the urinary secretion, and it is hard to see how the few grains daily absorbed could replace the great quantity poured out of the system in these cases.

It is thus clear that if phosphate of lime is of use in these cases (as it sometimes undoubtedly is), it must be by *striking at the root of the error of assimilation* possibly existing in the nerve centres. Its administration has been found to hasten the *repair of fractures*, and the withdrawal of lime salts from the food of animals renders the bones soft and spongy. The premature decay of the teeth in Americans is probably owing to the absence of lime salts, caused by the perfection of their machinery, which too effectually removes the external portion of the grain in the manufacture of flour.

In the stomach lime undergoes changes, and enters the blood as a different salt. *Anæmia* pure and simple, is sometimes benefited by a course of phosphate of lime, as are also *scrofulous adenitis*, *phthisis*, and *chronic diarrhœa*.

Kolischer treats *tuberculous joints* by the injection of a solution of acid calcium phosphate.

Parrish's Syrup is an elegant and useful form in which to administer the Phosphates of Calcium and Iron.

Calcii Hypophosphis, in common with other Hypophosphites, has been strongly recommended in *phthisis*. In their action they resemble phosphate of lime, and like it they possess none of the properties of free phosphorus. Some have fancied that

under the use of these remedies the tubercular or scrofulous deposits are more prone to the calcareous degeneration. In *chronic bronchitis*, with much expectoration in young subjects, accompanied with loss of flesh and sweating, the hypophosphites will often give better results than any other remedy. Probably in these cases they act as nervine tonics to the respiratory and other centres.

Fellow's Syrup affords an agreeable method of administering these remedies, and seems to supply every want, combining with the lime the tonic properties of quinine, iron, and strychnine, but the writer has found that it very often is not tolerated by the stomach.

R. *Calcii Hypophosp.* ʒj.
 Syrupi Aurant. ʒij.
 Aquæ Destil. ʒij. *misce.*

Fiat mist. st. coch. i., med. ter in die.

Calx Chlorinata (Chlorinated lime) is valuable, not on account of the lime, but because it gives off hypochlorous acid, a powerful oxidising agent; which destroys any organic matter with which it comes in contact. This acid, being itself unstable, gives off chlorine, which splits up any remaining matter by seizing on its hydrogen, and setting oxygen free. This double action makes this substance invaluable as a deodoriser. Plates covered with chlorinated lime, and moistened with water, placed in different corners of the sick room, give off, through the agency of the carbonic acid of the room, as much chlorine as keeps down effluvia. If more rapid deodorisation is required, the room is treated in a different way: the patient having been removed, the salt is placed in a deep basin, and diluted sulphuric acid poured on it, and the room closed up for 24 hours; in this way all the chlorine is liberated, and seizes upon the hydrogen, splitting up the ammonia, sulphuretted hydrogen, &c., with which it comes in contact.

By destroying the germs which cause putrefaction it acts as an antiseptic, and it destroys odours much better than carbolic acid, which has little power in this way, though this latter is a better antiseptic.

It is used with advantage when applied in solution to parasitic skin diseases and *foul sloughing wounds*, *ozæna*, &c. $\frac{1}{2}$ dr. of the solution added to 1 oz. water makes a good gargle in *malignant scarlatina* or *diphtheria* with fetid ulceration.

Internally, this salt has been recommended in *putrid fevers*, and may be given in the form of the solution, in 20 minim doses in peppermint water.

Calx Sulphurata is administered for the sake of an action which it is believed to possess over *suppuration*. It is regarded as an Antisuppurative, aborting the process if in its early stage; and benefit has followed its use in *boils*, *abscesses*, and *acne*. In large doses it is an irritant poison, and even small doses often nauseate seriously. It is best given ($\frac{1}{3}$ gr.) in pills.

↓ **Calumbæ Radix** is one of the most popular pure bitter tonics, and, possessing no tannin, is devoid of astringency, and may be freely given with iron. Chiretta, Quassia, and Gentian closely resemble Calumba in their effects upon the stomach. By the impression which they make upon the peripheral filaments of the nerves of the tongue and mouth, they increase the saliva and the gastric juice probably even before being swallowed. The gastric juice is further increased when they reach the stomach, and probably the vascularity of the organ is somewhat augmented, since these remedies in large doses cause irritation, and, when long continued, a low form of gastritis, apparently by over-stimulation. The gastric secretion being thus more freely poured out, the supply regulates the demand, and the appetite is improved. Changes of a similar nature probably occur further down the intestinal tube, and the digestion beyond the duodenum is possibly improved.

These bitters are used in *dyspepsia* and in the *debility attending convalescence from acute diseases*, where they are sometimes invaluable in stimulating the appetite and digestion. They are contra-indicated in all inflammatory states of the gastro-enteric tract. To get the full benefit of a vegetable bitter it is advisable to order its various preparations in combination.

R. *Tinct. Calumbæ* ʒj.

Infus. Calumbæ ʒviij. *misce.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die ante cibos.

Cambogia—Gamboge is a hydragogue cathartic; when swallowed in large doses it acts as an irritant to the mucous membrane of the digestive tract, exciting the various glands to pour out increased secretion, and thus augmenting considerably the watery element in the motions, which, after a full dose, become liquid. The vermicular contractions are greatly intensified, and the contents are swept rapidly down the canal.

Its action is severe, and the griping pains caused by it are very annoying, so that it is seldom now used alone, though it

is an excellent addition to many purgative pills. In small doses it is diuretic and the colouring matter has been said to stain the urine. The compound pill may be given in 5 grain doses every 6 hours in *dropsies* and *obstinate constipation*. The action of gamboge is more marked on the small intestine than on the colon. In large doses severe inflammation of the alimentary tract results, and death supervenes, unless, as is nearly always the case, active vomiting expels the drug early. In poisonous doses, Orfila found that it often only produced vomiting; owing to the violence of its action on the intestines their movements became paralysed. It has no action on the liver, though the presence of bile seems necessary for its absorption. Schaur found that the hypodermic injection of gamboge did not cause purging in dogs.

Camphora is very uncertain in its action, and the effects produced by small doses are so variable that it is not often employed internally save as a flavouring ingredient. In large doses (30 grs.) it is a diffusible stimulant, directly causing a flow of blood to the gastro-intestinal membrane, and may produce vomiting; by stimulating the nerve centres it produces a comforting and exhilarating effect, occasionally going the length of gay delirium and convulsions, with increase of the strength of the pulse and the cardiac contractions, and when continued for some time it produces *loss of power of the sexual organs* (though small doses have the opposite effect). This latter may be said to be the only definite useful result of the internal administration of camphor, and it consequently is valuable in *excitement of the genitals, chordee, emissions, &c.* In large doses it lowers the temperature. The vapour is reputed to possess marked effects upon *catarrhal affections of the respiratory membrane*, and 10 grs. added to each dose of expectorant mixture are useful in the *chronic bronchitis* of the aged, and 10 to 15 gr. doses, repeated every six hours, benefit *hysteria, dysmenorrhœa, and other spasmodic affections*.

Externally, it is a stimulating application, useful in *chilblains*, and its mild rubefacient properties render it a popular ingredient in most liniments for *rheumatic troubles*. The Compound Camphor Liniment is a powerful counter-irritant, and may be made to cause vesication. $\frac{1}{2}$ dr. camphor to 1 oz. of zinc ointment allays the itching of *eczema* about the genitals.

Milk dissolves camphor readily, 1 oz. taking up nearly 1 dr. of it, and it is the best method of administering the remedy, especially in *low fevers*, where a tea-spoonful of the milky solution may be given every three hours.

Rubini's solution consists of a solution of 1 oz. camphor in 1 z. (by weight) absolute alcohol. Dose 3 to 8 minims.

Canellæ Cortex is a mild stimulating stomachic, increasing the vascularity of the gastric mucous membrane and augmenting

its secretion, and has been used as a condiment. It is now only employed to flavour rhubarb wine.

Cannabis Indica is a true narcotic, like alcohol or opium, producing first a period of excitement, or intoxication, followed afterwards by sleep and coma. Its exciting stage, however, is better marked than that of these remedies, and is much *longer* than that of opium. It is freely indulged in, in India under the name of Hashish. The intoxication, often lasting a couple of hours, is characterised by delirium of a pleasant or boisterous kind, with surprising mental confusion and distorted mental ideas of the patient's individuality and position, alternating with fits of prostration bordering on catalepsy, and followed eventually by sleep, in which pleasant or mirthful dreams generally run riot. The stomach is not affected, and the appetite may be increased. It is a powerful aphrodisiac.

The sensibility is diminished, cutaneous anæsthesia and blunting of the muscular sense being observed. The pupil is dilated, constipation does not follow, and sweating is never great; hence its use has been followed by gratifying results as an anodyne in *neuralgia* and in *migraine*, a hypnotic in *sleeplessness*, *delirium tremens*, and especially in *mania*; an *antispasmodic* in destroying spasm and pain, as in *asthma*, *hepatic*, and *renal colic*. &c. Stephen Mackenzie has found that full doses, morning and night, relieve dull *continuous headache* when other remedies fail. It is stated to act as a direct stimulant to the uterus in *menorrhagia*, and it allays ovarian irritation. It has been successfully used in the treatment of *tetanus*. It has been noticed that *hæmaturia* has disappeared after the administration of this drug, and sometimes it acts as a diuretic.

The tincture should be given in sherry, or in a tea-spoonful of brandy, on account of its decomposition when added to water, but 1 oz. of mucilage emulsifies 1 dr. of tincture. The *fresh* extract made into a pill will be found the most reliable form, and the following is an elegant combination for gastric pain:—

R. *Bismuthi Subnit.* gr. lx.

Ext. Cannab. Ind. gr. vj. *misc.*

Divide in pil. xii. Sumat i. bis in die.

In the section on non-official remedies the reader will see noticed a preparation under "Cannabin Tannas."

Cantharides is not often administered internally, though it produces definite results, acting as a powerful irritant to the stomach and genito-urinary organs, causing in over-dose frequent, painful, bloody micturition, with priapism, bloody, pain

ful stools, salivation, and symptoms of violent irritant poisoning, followed by convulsions, delirium, and asphyxia.

In small doses it is diuretic, aphrodisiac, and emmenagogue. The cantharides is absorbed, and circulating in the blood, reaches the urinary organs, which it irritates as it is being eliminated. The effect of cantharides upon the kidneys begins as a genuine inflammation within the glomeruli, which gradually spreads among the cells of the tubules until all the tubes become affected, producing albuminuria and hæmaturia. The mouth, stomach, and intestines are affected by direct contact with it after being swallowed, and its action on the genital organs and uterus is generally explained by the sympathy that exists between these parts and the urinary tract.

It has been advocated in various *kidney diseases*, after the acute stage, as a diuretic, and it is valuable in *bladder* cases, which are characterised by want of power in the sphincter especially in women. It has been recommended in *impotence*, *gleet*, and *leucorrhœa*. In the section upon non-official remedies, under Cantharides will be found a brief description of the new method of treating tubercle by this agent.

Lukomsky states that with cantharides the Russian peasantry cure *hydrophobia* in domestic animals.

1 to 3 minims of the tincture will be found enough for an ordinary dose, freely diluted with barley water.

Externally, cantharides is used diluted in various ways as a rubefacient, as in *stimulating applications to the scalp*, where the object is to keep up a constant excessive supply of blood for the nourishment of the hair bulbs, but it is for producing vesication that the Spanish fly maintains its importance in medicine. It acts by causing a rapid local inflammation of the skin, beginning with tingling pain, heat, redness, and eventually swelling; serum appears in from 4 to 12 hours.

The peripheral extremities of the nerves supplying the skin of the affected part conduct the stimulus of the blister to the nerve centres, from which it may be radiated, transferred, or reflected to centrifugal or trophic nerves, which may effect various changes in the areas to which they are supplied.

In this, the most probable explanation, it is easy to see (1) the effect which blisters may produce upon distant parts; (2) they also affect parts in the immediate neighbourhood by extracting the blood from them, though this must be to a small extent; (3) they may affect neighbouring parts by direct spread of the irritation originally produced, as the peritoneum and pleura have been seen inflamed from the application of a blister to the abdomen or chest; and the writer believes that he has seen pericarditis produced in this way in thin subjects. Brunton

points out that the skin and tissues immediately underneath the blister are congested, whilst the deeper layers of tissue have their vessels contracted. Through thick parietes a blister would not likely cause congestion of the pleura.

In *neuralgia*, blisters applied over the seat of pain intensify the suffering, they should be applied close to the spine—over the posterior branch of the spinal nerve-trunk—from which the painful nerves issue; *sciatica* is often benefited by a small blister, placed over the course of the nerve.

Various *eye inflammations* are modified or checked by counter-irritation behind the ear; and though the usefulness of blisters is doubted in *acute pleuritis* and *pneumonia*, there can be little question of their value in causing the absorption of long-standing pleural effusions, in which cases great good is derived from *flying blisters*—that is, a series of very small blisters (each not larger than a crown), kept on for a short time—say two hours. Indeed, it may be laid down as a rule that any benefit to be had from a blister is obtained during the first five hours of its application, all of which time it keeps up a stimulating effect upon the general system; after this, much depression often results, which cannot be accounted for as some suppose, by the mere loss of serum; if vesication does not occur in this time a poultice generally determines it.

In *acute rheumatism*, blisters to the affected joints have been long advocated; but Dr. Harkin has pointed out surprising results obtained by a large blister over the heart, early in the disease, and the writer has seen it reduce temperature and pain in a most decided way. Graves recommended blisters in various *prostrated feverish states*, and counter-irritation over the nape of the neck controls many forms of *headache*.

Dr. Harkin obtained good results in *diarrhœa* and *cholera* by blistering the skin over the course of the vagus in the neck. Petit and M. Verneuil have corroborated his views about the successful treatment of hæmorrhages like epistaxis and rebellious bleeding from piles, &c., by revulsion over the liver region.

For all purposes the emplastrum cantharidis is the most manageable preparation—the liquid or collodion acts much more quickly. Unless the bleb is large it may be let alone, the blistered surface being covered with greased lint or cotton wool. Sometimes cantharides affects the urinary organs after a blister, by being absorbed through the skin; free diluent drinks, with a morphine suppository, generally remedy this.

Blisters should not be applied or kept long on the old or infirm, or on paralysed parts, or on the very young, or in acute kidney diseases.

Brunton advises that when *absorption* is the result desired the blister should be applied directly over the part, but if reduction of congestion or inflammation is aimed at it should be applied at a little distance, as in pericarditis it might, if applied directly over the inflamed sac, increase the mischief.

Capsicum when taken into the mouth increases the secretion of the salivary glands ; when swallowed it acts as a stimulant to the mucous membrane of the stomach, and increases its secretion, its internal local action being probably like its external rubefacient effect so that it might be called an internal rubefacient. In repeated doses it produces a slight narcotic effect, and it increases the functional activity of the genital organs. In large doses it causes gastro-intestinal irritation, or inflammation. It may act as a diuretic.

Prof. Chéron believes that it acts upon the vascular system, and, like ergot, affects powerfully the unstriped muscular fibre in the walls of the vessels either directly or through the vasomotor nerves. Some benefit has followed its use in *uterine hæmorrhage* in doses of 2 to 10 grs.

The stomachic effects of cayenne are seen in its free use as a condiment and appetiser in warm climates, and, it is useful in *dyspepsia*, and invaluable as a tonic in *dipsomania*, in which 10 to 20 minims of the tincture may be given every two hours before meals. In *delirium tremens* large doses (30 grs.) sometimes produce sleep. Locally, it is useful in the form of a gargle for *relaxed throats*. 1 dr. tincture with 1 dr. tannin, and 10 oz. acid infusion of roses makes a splendid gargle. Concentrated preparations will redden the skin almost to vesication, but with much pain and burning, and are said to remove the discoloration of *bruises* ; a paste composed of capsicum, and known as "Chilli paste" is used as a popular rubefacient.

R. *Tr. Capsici* ℥iij.

Spt. Ammon. Aromat. ℥i.

Tr. Cinchonæ ℥j.

Tr. Card. Co. ℥vj.

Aquam ad ℥viiij. *misce.*

Fiat mistura, signa, "A table-spoonful with the same quantity of water every two hours, or when the craving for drink comes on."

Carbo Animalis and **Carbo Ligni**—The first is employed internally as an antidote in poisoning by the alkaloids morphine, trychnine, &c., with which, if given immediately afterwards, it

combines, and renders their action harmless— $\frac{1}{2}$ oz. neutralising 1 gr.—but its administration should not interfere with the use of the stomach pump, emetics, and purgatives, which should follow.

Internally, wood charcoal is administered in *flatulent conditions of the stomach and intestines*, as an absorbent and deodoriser; it occasionally checks vomiting and the formation of gas, and stops fermentation and purges mildly. Jenner used charcoal in dr. doses as an enteric disinfectant in *typhoid*, but it is possible that it might cause irritation of the ulcers in the bowel.

Externally, charcoal acts as a powerful deodoriser and anti-septic, and, as such, may be freely applied to *putrid sores* and *gangrenous limbs*, or it may be spread on plates to sweeten the air of the sick room. These properties depend upon its power of absorbing and condensing in its pores gases like oxygen, which destroy the gaseous products of putrefaction by coming into direct contact with them. The charcoal poultice is an excellent application to *foul ulcers*. Animal charcoal may be given like the wood preparation, in tea-spoonful doses in water. It should be freshly prepared or reheated before use, and administered *dry* in wafer paper.

Cardamomum acts as a warm stomachic and carminative, like ginger, increasing by its stimulating action upon the gastric surface the secretion of the part, and improving the appetite. Its local stimulating influence increases by reflex action the peristaltic movements of the intestines, and thus flatus is dispelled. It makes a good corrective addition to purgative medicines, and, as the tincture is of a bright red colour, compatible with most drugs (iron excepted), it is a prized flavouring and colouring ingredient, and medicine containing it has a better chance of remaining in an irritable stomach than if given alone.

Carui Fructus—Its action is explained under *Anethum*, with which it is practically identical.

Caryophyllum—Cloves—when administered, act as a stomachic. This remedy resembles the previous two in its tonic, carminative, and stimulating effects. The essential oil is powerfully antiseptic; when applied to the terminal filaments of a painful and irritated nerve it acts as an efficient anodyne; hence its use in *toothache* and in some cases of *superficial neuralgia*. Five drops on a little sugar speedily remove pain caused by accumulations of air in the bowel, by exciting reflex muscular contractions, driving the air forwards or backwards, relieving over distention, and acting as a local anodyne to the irritated nerves of the part. The recent experiments of Brunton and Carl show that carminatives, like cloves, do not cause absorption

of the gases in the bowel. They found that oil of cloves markedly increased the secretion of the bowel.

Cascara Sagrada is, in large doses, an irritant to the gastrointestinal membrane; in moderate doses ($\frac{1}{2}$ dr. liquid extract) it acts as a stimulant to the entire glandular apparatus of the alimentary canal, increasing slightly the *secretion* and markedly the *peristaltic action* of the intestine by stimulating the muscular fibres, and producing healthy copious evacuations. Smaller doses (5 to 10 minims) have a decidedly tonic effect upon the stomach, like the vegetable bitters, increasing the appetite and mildly stimulating the liver. Cascara is the best remedy yet introduced for *chronic constipation*, and the dose can be so graduated that painless, soft natural motions are voided daily where constipation has been the rule for years. The dose can be gradually *diminished* while the good effects remain, and generally even in aggravated cases no augmentation of the dose is necessary. The liquid extract may be given in doses of $\frac{1}{2}$ to 1 dr. night and morning for 4 or 6 days, when the morning dose can be reduced to a half or omitted. The solid extract may be likewise employed in pills. After a time the drug can be entirely withdrawn.

It has been said to relieve the joint pains in *acute rheumatism*; it may be combined with salicylate of soda.

R. *Extracti Cascaræ S. Liquidi* ℥ii.

Tr. Nucis Vomice ℥iii.

Glycerini ad ℥iv. *misce.*

*Fiat mistura cujus capiat ℥i. mane nocteque ad 4^r
vicem deinde omni nocte.*

Cascarilla is an agreeable tonic, acting like Calumba, only it possesses decided aromatic qualities. It has feeble febrifuge properties, like cinchona, and the volatile principle which it contains may possibly act upon the respiratory mucous membrane. It is useful in *dyspepsia*, where a stimulating tonic is indicated, and when smoked in a pipe it is valuable as a *substitute for tobacco* when we wish to wean heavy smokers from their vice. V. G. Smith gives the following in convalescence from fevers:—

R. *Acid. Nit.-Mur. Dil.* ℥ij.

Tinct. Cinch. Co. ℥j.

Infus. Cascarillæ ad ℥viii. *misce.*

Capiat ℥ss. vel ℥i. ter in die.

Cassiae Pulpa—This preparation is very seldom used in medicine except as an ingredient in senna confection. It is a mild laxative, like manna, and it probably acts by stimulating the peristaltic movements of the intestines.

Cataplasmata are used in medicine with different intentions: thus sinapis is a rubefacient, lini an emollient, conii a sedative, and carbonis and sodæ chlor. antiseptic; but linseed is by far the most frequently employed. When a hot linseed poultice is applied to a part, the warmth causes the small vessels to dilate freely; the muscular elements in the skin, hair follicles, and gland ducts are relaxed, and thus the tissues get soft, and the tight feeling or tension of inflammation is reduced or passes away; the sensitive nerve endings experience less pressure by the blood being drawn to the surface. A warm poultice to the *inflamed hip joint* sometimes relaxes spasm of the muscles and diminishes the transferred knee pain.

Poultices should be as warm as can be comfortably borne; a very hot poultice will often aggravate pain and tension by acting as a direct local stimulant.

The question often arises, when should poultices be applied to local inflammations, as in a case of *whitlow*? If applied early, general relaxation of the tissue is the result, and the tension which is fatal to the life of the part is removed, and resolution is more liable to occur; but if inflammation has already progressed so far that the white corpuscular elements have wandered through the coats of the vessels, or a purulent collection has already formed, poulticing assists it materially in reaching the surface. Thus poultices, by making the part an internal one, are useful in *all stages of inflammation*; if applied early they prevent suppuration, and if used in the advanced stages they hasten or encourage it; and if an antiseptic quality existed in them, everything that is desired would be achieved. We have this desideratum in the spirit lotion when covered in with oiled silk.

Catechu is a valuable astringent, acting exactly like tannic acid (which see). It is given in *passive diarrhœas* and *hæmorrhages*, and is well suited for the treatment of such cases in children. It may be chewed before food in *pyrosis*.

(For Diarrhœa in a child 1 year old.)

Rx. *Tinct. Catechu* *ʒiij.*
 Spt. Chloroformi *ʒi.*
 Mist. Cretæ ad *ʒiv. misce.*

Fiat mist. cujus capiat coch. i. min., post singula dejectiones liquidas.

Cera Alba, Cera Flava, and Cetaceum are seldom employed internally. When swallowed they act as protectives or demulcents, by covering over the gastro-intestinal surface from irritating secretions, and externally they are largely employed as emollients. Possessing bland, unirritating qualities, they are valuable in making the groundwork or basis of more active ointments or cerates. Spermaceti formerly was much employed as an expectorant, but it most probably is devoid of such virtue. It may be given beaten up with egg and warm milk.

Cerevisiæ Fermentum has been found a tonic stimulant in *fevers*, and was used by Dr. Stoker as such in 10,000 cases, as mentioned by Neligan. It is a laxative and deodoriser, and prevents the decomposition of matters in the bowel; it has been given for *boils* and in *dysentery*. It is used now only as the yeast poultice, to correct the fetor of *putrid sores*, and this preparation seems to owe its efficacy to carbonic acid. It causes pain, and possesses no special advantages over other more manageable deodorants.

Cerii Oxalas is a gastric sedative, acting probably like bismuth. The Pharmacopœial dose is too small; 5, or even 8 grs. may be given. It was introduced as a remedy for the *vomiting of pregnancy*, but it is gradually falling into disrepute. It has been tried in *epilepsy* and *chorea*, with very doubtful results.

Cetraria is a feebly nutritious tonic, containing a considerable quantity of starch and a small amount of bitter principle. It is largely eaten as food by the Laplanders, and, by its demulcent properties, when made into blanc-mange, is useful to many *dyspeptics*. It has been praised as an expectorant, but it is very improbable it has any such action.

Chirata is a pure bitter tonic, exciting very gently the secretion of the gastric juice, like calumba, gentian, and quassia, aiding digestion and improving the appetite. Its effects are best seen in the *atonic state of the stomach of drunkards* after a prolonged course of drinking, and it may be combined with bismuth or a mineral acid, the former if *nausea or vomiting*, the latter if a *furred* state of the tongue exist.

Chloral Hydras induces sleep identical in every respect with sound, natural, refreshing slumber, lasting 5, 6, or 8 hours, devoid of dreams, and free from stupor and narcotism, and not followed by gastric or other trouble. It does *not* act, as Liebreich—its introducer—supposed, by being decomposed in the blood into chloroform on meeting the alkali of the circulating fluid, since this is too weak to decompose it, and the odour of chloral and not of chloroform is perceived from the breath; and chloroform is not found in the blood.

Chloral does not markedly relieve pain, nor influence the nerves of sensation, in safe doses ; hence if severe pain is present, chloral unlike opium, will not relieve it, unless in doses just short of affecting reflex action, and if the pain continue, probably no sleep will supervene. Reflex action is weakened and destroyed by large doses, the blood pressure falls from the vascular dilatation caused by paralysis of the vaso-motor centre, and the cardiac ganglia ; the pulse and respiration are slowed ; and if a still larger quantity is administered, loss of sensation and deep coma occur. Death results from paralysis of the heart by its effect upon the cardiac ganglia, or stoppage of the respiration ensues through its action upon the respiratory centre. The *temperature falls markedly*, and Brunton found that this fall was so great as to alone cause death. The motor nerves or muscles are not directly affected, but the pupil is *contracted*. The drug appears in the urine, and if this secretion be alkaline it may change the chloral into chloroform.

Chloral is used as an hypnotic in *sleeplessness, caused by over-work or worry*, and *delirium tremens* is the affection in which its virtues have been most prized, given in 20 to 30 gr. doses. After the delirium has lasted several days, the writer believes chloral to be a dangerous remedy, which must be used with great caution, if employed at all, the heart at this time being especially susceptible to its action. He believes that the use of chloral raises the mortality in this disease, and he now only uses it with fear and trembling when every other means fail, which is *very* seldom.

It is powerfully antispasmodic, and has been used with benefit in *infantile* and *puerperal convulsions*, *chorea*, *asthma*, *sea-sickness*, and *acute mania* ; and it is highly beneficial, and occasionally curative, in *tetanus*. Excellent results are obtained in *whooping-cough*—a child 2 years old may get 1 to 2 grs. every 3 hours. Playfair thinks that it relieves the early *pains of labour*, without directly hindering the uterine contractions.

Chloral should be given with great caution to patients with fatty hearts or atheromatous vessels ; and as its hypnotic effects come on in a very short time (less than 30 minutes), and pass off as rapidly, it should be repeated inside an hour or two if the result is not produced, and the patient should always be in bed before swallowing the first dose. Externally, it is a good antiseptic, and a lotion of 8 grs. to 1 oz. is a painless stimulant to *unhealthy ulcers*, and often cures *eczema*.

Powdered chloral sprinkled over adhesive plaster, gently warmed and laid on the skin, makes a painless, speedy, and effective blister, superior to cantharides (Fauntleroy).

Chloral Camphor is a liquid consisting of equal quantities of chloral and camphor rubbed together ; it dissolves morphia

and other alkaloids, and is an elegant application in superficial *neuralgias*. Chloral menthol is prepared in the same way.

Chloral is used as an antidote to strychnine and Calabar bean. In addition to its treacherous action upon the heart, chloral is very liable to induce a chloral habit upon those who use it often, and as the victim goes on increasing the dose so as to induce sleep, without any warning he may take a dose which stops his heart. (See under Poisoning).

Chlorine, when inspired, acts as a powerful irritant, causing death from spasm of the glottis or inflammation of the air passages; greatly diluted with air it is a stimulating expectorant.

Externally applied it is a rubefacient, but it is only used in medicine for its powerful antiseptic and deodorising properties. (See *Calx Chlorinata*.) Internally, the solution of chlorine has been recommended in *fevers* as a germ destroyer, but in doses sufficient for this purpose it would rapidly destroy life.

Chloroform is used in medicine as an inhalation to produce general insensibility, and is swallowed or applied externally as a remedy for various complaints. The vapour, when inhaled, gives rise at first to symptoms often differing widely in different individuals, and depending upon some peculiarity of the patient. Generally three stages may be observed:—

* 1st—The “Preliminary Stage,” with some cough or suffocative feeling, stimulation of the cerebral convolutions and higher centres, exhilaration of spirits, sounds in the head, mental confusion, with congestion of the eyes and face, and symptoms resembling mild alcoholic intoxication. The sensibility is blunted.

2nd—Or “Struggling Stage,” with marked mental or motor excitement and intoxication, acceleration of the pulse (from excitement), lividity of the face, greatly diminished sensibility, and dilatation of the pupils;


and Rapidly passing into

3rd—The “Anæsthetic Stage,” or state of complete narcosis, where there is total insensibility and muscular relaxation, with suspension of the cerebral functions, and more or less paralysis of the lower or organic life centres, loss of reflex action, diminution of the force of the pulse, and contracted pupils.

The operator recognises this stage by holding up a limb and it falls perfectly flaccid; by touching the conjunctiva, when no attempt at winking occurs; by exposing the iris suddenly to light after having the lids closed, and sluggish contraction follows; by pinching strongly the skin of a sensitive place, and not the slightest wincing is noticed.

If the inhalation is pushed further, death may occur. 1. The *respiration* is interfered with, so that death occurs through apnœa

from the stoppage of the breathing, through the action of the chloroform on the respiratory centre, or on account of the tongue falling back, or vomited matter getting into the trachea. 2. By the *heart* becoming *directly* paralysed, through the influence of the chloroform on the cardiac ganglia; and this may happen at any stage, and without warning.

 Respiration must be carefully watched and its irregularity or failure met by the instant removal of the inhaler; and if there be asphyxia, the chin should be forcibly drawn away from the sternum, or the tongue drawn forward, or artificial respiration, which is the best remedy to rely upon, may be performed; the cold douche may be used at the same time. When the heart stops, the patient's head should be placed lower than his body, artificial respiration should be kept up, and nitrite of amyl, ammonia inhalation, and galvanism may be tried. Hypodermic injection of ammonia appears to be the most promising treatment.

Brunton believes that death may be often the result of *shock*, and may be caused by too little instead of too much chloroform. He explains how death has so often followed the performance of trivial operations where deep narcosis is generally considered unnecessary. When no chloroform is administered, the stimulus to the sensory nerves produced by an operation, causes reflex contraction of the vessels and raised blood pressure which overcomes the depressing effect at the same time always produced upon the heart by reflex action, and all goes well; but when partial anæsthesia has been produced, reflex contraction of the vessels may be lost whilst the depressing reflex effect of the operation upon the heart may still remain, death from the shock of the operation following. When the narcosis is *deep*, both the reflex depression upon the heart and the reflex contraction of the vessels are absent, and the stimulus of cutting sensory nerves does not affect the heart one way or other.

Various inhalers are used. Clover's, which prevents the vapour reaching the lung in a more concentrated form than four per cent., is often recommended; but the open sponge or towel, with the chloroform dropped on it, answers every purpose, and one dr. will be enough to begin with. No food should be allowed for five hours previously, but the plan of starving for a longer period than this is to be condemned, as it leaves patients in a bad condition to resist the effects of hæmorrhage or shock, especially those with vigorous digestive powers, who are accustomed to the stimulus of food every four or five hours.

Chloroform should always be administered with great caution, and if there be fatty or other disease of the heart the caution, should, if possible, be increased. There is hardly any state of the system in which the drug may not be used, and it may be administered at all ages, children, as a rule, bearing

it well. The vomiting so often following its use may be to a great extent prevented by a previous hypodermic injection of morphine to which a little atropine has been added.

The recent report of the Hyderabad Chloroform Commission has for the present settled the vexed question of Ether *versus* Chloroform, and the decision in favour of chloroform is given in no uncertain language.

The reporters preface the code of rules drawn up for the safe administration of the drug, by saying "that Chloroform may be given in any case requiring an operation with perfect ease and absolute safety, so as to do good without the risk of evil."

For the rules see the Author's Dictionary of Treatment, page 704.

The Commission was appointed to confirm or disprove Syme's and Simpson's principle that we should be guided as to the effect of chloroform entirely by the respiration, it claims to have *proved* that the art of administering the drug with safety consists in *keeping the breathing absolutely regular throughout the inhalation*; to watch the pulse at all being both wrong and dangerous. The use of any apparatus save an open cone or cap is condemned.

With many, the A.C.E. mixture is a favourite remedy for producing anæsthesia; it consists of 1 part of absolute alcohol, 2 parts of chloroform, and 3 of ether (S.G. .720).

Chloroform inhalation is employed for surgical operations, *puerperal* and *uræmic convulsions*, during the progress of *gall stones* and *renal calculi*, and largely in *obstetric practice*, in which it is most decidedly freer from danger than in any other class of cases, and the third stage of its action should never be experienced in labour unless where a difficult instrumental delivery is about to take place. The patient can be kept just upon the border of dreamland, without producing insensibility. In a host of spasmodic ailments, as *laryngismus*, *pertussis*, and *asthma*, the vapour of chloroform is highly beneficial, and often curative, and it is of great benefit to the physician in carrying out the *diagnosis of phantom and uterine tumours*.

Internally, chloroform in small doses acts as a gastric stimulant, rapidly followed by sedative effects, probably by affecting the peripheral nerves in the same way as a pure narcotic affects the great centres. It acts in this way when given in 1 minim doses, properly diluted, and relieves *gastralgia*, *vomiting*, *sea-sickness*, and *reflex headache*. From 10 to 20 minims affect the system, causing, after absorption, marked narcotic effects, and, if repeated, symptoms resembling those following its inhalation; administered in large quantities, undiluted, it acts as an irritant poison. From its effects upon the centres of sensation, it is useful as an anodyne, relieving pain, inducing sleep, and preventing spasm,

and its influence is intensified when opium is combined with it, as for the relief of cough and hiccough.

Externally, chloroform applied on lint to the skin and quickly covered with oiled silk, acts as an irritant occasionally producing vesication. If uncovered or if diluted before being applied, it acts as a local anæsthetic by its influence over the endings of the sensory nerves, and hence it is useful in *neuralgia*, *odontalgia*, and *urticaria*.

Dr. Waller has shown that it greatly assists the absorption of alkaloids through the skin, the chloroform rapidly penetrating and carrying with it the dissolved substance.

The "deep injection," as introduced by Bartholow, is a valuable method of subduing *neuralgic pain*. He injects 10 minims or more of chloroform through the hypodermic needle thrust deeply into the tissues surrounding the affected nerve.

Chrysarobin contains chrysophanic acid and is itself frequently known by that name. Unfortunately sad confusion exists about these substances—first there is the B.P. Chrysarobin, Araroba or Goa Powder, which is wrongly described as the medullary matter of the stem, it being a concretion, and, moreover, it is the *crude* drug which has been by mistake introduced; secondly, chrysophanic acid is loosely employed as a synonym for chrysarobin; it is an oxidation product of the latter drug, and a much less powerful reducing agent. For internal and external use the *pure* chrysarobin only should be prescribed and used.

It is a remedy of value in chronic *psoriasis*. An ointment (of from $\frac{1}{3}$ to 1 dr. mixed *intimately* with 1 oz. of heated lard or vaseline) rubbed twice daily into the scaly patches of this disease rapidly causes their disappearance. It frequently produces a painful erythematous inflammation of the surrounding healthy skin, which prevents its use in some patients. The writer, after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands, *and not permitted to touch the healthy skin*. This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion. Traumaticine will be found even more satisfactory.

It acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with psoriasis. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and

the writer found, by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

This observation is strengthened by the experiments performed by Lewin and Rosenthal upon rabbits ; they found that an ointment of chrysarobin, when applied externally was absorbed and partly converted into chrysophanic acid in the system ; a part not oxidised was demonstrated in the urine.

In the same way success has followed the internal use of chrysarobin in *psoriasis*, *eczema*, *acne*, &c., but it often produces violent griping, purging, vomiting, anorexia, and malaise sometimes after doses as small as $\frac{1}{8}$ gr. in a pill. Chrysarobin is a powerful parasiticide, and has proved efficacious in *ringworm*, *tinea*, &c.

The deep purplish discolorations which it produces on the skin and bed linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grs. to 1 oz.) with benefit. The discoloration can be partially removed by weak vegetable acids.

Brooke's Salve Sticks are a splendid way to use chrysarobin. Liebermann finding that chrysarobin had such powerful affinity for oxygen thought that its action depended upon this, and that in its oxidation to chrysophanic acid it robbed the parasites of their oxygen and killed them. He has discovered an almost identical substance, which he now uses instead of Chrysophanic acid (see under Anthrarobin).

Cimicifuga enjoys some reputation as a remedy in *acute* and *chronic rheumatism* ; it often is of use in cases of *muscular rheumatism*, *lumbago*, *sciatica*, &c., and has been used as a stimulating *expectorant* and in *chorea*. The drug in this country has fallen in estimation—the writer believes on account of its being kept too long, as it soon deteriorates. Large doses cause vomiting, vertigo, tremors, exudation from the bronchial mucous membrane, and a marked *diminution in the frequency of the pulse*. Small doses are said to act as a cardiac tonic, like digitalis, while larger doses appear to powerfully depress the heart, as hellebore and aconite do.

It acts powerfully on the uterus, and 5 drops of the tincture every two hours are recommended in *congestive dysmenorrhœa*.

Cinchona, Cinchonine, Cinchonidine, and Quinine—Cinchona differs from its alkaloids in being more astringent, 50 times more bulky, more apt to irritate the stomach, and more difficult of absorption. Quinine possesses great power as a destroyer of the life of minute organisms. Less than 1 grain dissolved in 1 ounce of water will cause the instant death of active infusoria and fungi, and double this strength prevents or checks the alcoholic fermentation and destroys putrefactive decomposition, acting as an antiseptic, like carbolic acid.

Single large doses of quinine, or moderate doses of 2 to 5 grs., frequently repeated, give rise to a group of unpleasant symptoms, called "cinchonism"—viz. : ringing noises in the ears, or deafness more or less complete, partial blindness, headache, and delirium, with nausea and insomnia. These effects, Harley believes, are produced by the direct action of quinine upon the nerve vesicles. Other observers (amongst whom is Binz) believe that cinchonism depends upon anæmia of the brain, while it has been asserted that congestion of this organ has to answer for the symptoms. Large doses frequently repeated cause an intensification of all these symptoms, with giddiness, dilated pupils, embarrassed respiration, convulsions, paralysis, stupor, and collapse. There is diminution of blood pressure from weakness of the heart and paralysis of the vaso-motor centre, loss of reflex action from its effect upon the cord, tissue change and oxidation are distinctly lessened, and the urea and waste products are diminished, and the respiratory centre becomes paralysed.

In febrile conditions larger doses are tolerated without causing unpleasant effects. In Germany the sulphate of quinine is administered in fevers in 40 gr. doses. As much as 1 oz. has been taken without any serious results.

In small doses, quinine may be taken as the type of a tonic, increasing at first the activity of the process of secretion in the stomach, but after a time checking it ; and if continued too long, or if the dose be increased, the digestion and appetite become somewhat impaired, and an irritable condition of the gastric mucous membrane results.

Small doses have *no* effect on the pulse ; moderately large doses (10 to 20 grs.) increase the number of pulsations, whilst slightly diminishing their power ; and very large doses (40 to 80 grs.) cause cardiac depression, with great fall in the number of pulsations and in the tension.

In health, quinine appears (short of serious doses) to possess no influence over the body heat. In disease, however, full doses of the drug cause a steady diminution in the temperature when this is considerably above the normal standard.

Thus quinine ranks as an anti-pyretic, and various ideas prevail as to how it acts in these *febrile* affections. Its influence

over the circulation does not account for it, and it is not probable that it exercises its beneficial effects solely by its action on the heat centres. Its power to diminish fever heat is partly due to its effect in retarding oxidation and tissue waste, thus Binz believes that quinine in *febrile diseases* "acts by directly combating the efficient cause of the disorder, and by checking the abnormal metabolism going on in the body, the nervous system taking no part, or only a secondary part, in the operation." It is possible that quinine prevents the growth of the organisms which exist in the blood, and which are the direct cause of the febrile condition. To do so outside the body would require contact with a solution of at least 1 in 900; and after, say half a dr. of this drug was administered, assuming it all to be absorbed and retained in the blood, a solution of not more than $\frac{1}{3}$ this strength would be operating upon them. This might be more than enough for the destruction of organisms living in a vital fluid, which is itself antagonistic and unfavourable to their existence. It has been also supposed to act as a *restorative* in various diseases, supplying some substance identical with a normal component of the blood.

Quinine has been proved to possess a peculiar power over the movements of the white corpuscles of the blood, and it is supposed in this way to reduce the size of the spleen in ague, and check inflammations in their first stage. (It is by no means clear that quinine *does* reduce the enlarged spleen).

The red corpuscles are increased in size, but are prevented from exercising their oxygen-carrying functions by large doses of this drug, and increase is observed in the quantity of nitrogen in the urine in fevers. Dr. R. B. Wilde has made careful observations, which promise to be of clinical value. He found that full doses completely paralyse contractile tissues, larger doses still, cause the tissues to pass into a state of rigor mortis, the cardiac muscle being extremely contracted.

Large doses (20 grs.) cause contraction of the gravid uterus.

In *intermittent fever* quinine cures the disease, and also affords protection to those healthy subjects exposed to the malarial poison. Its action here has been long believed to depend upon its destructive power over the minute organisms causing the disease.

In the milder forms of *ague* the best method of administering quinine is to give it in small doses four or five times a day, but in malignant attacks it must be pushed in large doses. Some give 10 to 20 grs. one hour before the fit, but half this quantity may be regularly given every six hours in bad cases, or 10 grs. may be given during the sweating stage, and repeated in five hours before the next paroxysm.

Its use should be continued for a time after the disappearance of symptoms, and if the stomach will not tolerate it, it may be given by the rectum, or an ethereal solution may be injected under the skin.

In *remittent fever* quinine may be given in moderate doses during the remission, but it is advisable to give one full dose (10 to 15 grs.) at once without waiting for the remission.

Besides its use as an antipyretic remedy in *typhoid*, *typhus*, *variola*, *pneumonia*, and *acute rheumatism*, it has been employed with marked benefit in *various septic states*, and in *pyæmia* and all exhausting suppurative conditions. The theory that it acts in disease by destroying minute organisms has led to the use of weak solutions locally applied in *hay fever*, *sore throat*, *whooping-cough*, and *diphtheritic ophthalmia*.

Quinine has been proved to be valuable in various forms of *neuralgia*, especially in those with well marked periodic exacerbations of pain, and in the *anæmic*, and in those suffering from prolonged worry and mental overwork. It should be given in 5 to 10 gr. doses at bed-time with a full opiate.

It has been recommended in *chronic suppurative bronchitis*, but the writer has found it often to increase the difficulty in coughing up the expectoration. It is probable that it exercises some toxic effect upon the cilia in these cases, which necessitates the respiratory muscles and bronchial tubes discharging the duty often silently performed by the cilia; at the same time the secretion is diminished in amount and increased in viscosity.

The greater part of the quinine administered passes out of the body in the urine, the elimination lasting several days; some probably remains in the system; traces of the alkaloid have been found in the secretions of the skin, salivary glands, and intestines. Iodide of potassium solution holding free iodine affords an easy method of showing its presence in the urine by causing a brown precipitate, the reaction may be demonstrated within 40 minutes after the quinine has been swallowed.

Cinchonine and Cinchonidine appear to act very much in the same way as quinine, but not so powerfully; they depress the heart more than quinine does.

The *decoction* of bark is an inelegant and unstable preparation, though, perhaps, the favourite. The *infusion* is by far the best form in which to administer cinchona elegantly and cheaply. It contains a higher percentage of alkaloids in proportion to the amount of bark used. The *new official liquid extract* is a great improvement upon the older preparation. Its use has been lauded in *dipsomania*.

Quinine may be given in powder, pill, mixture, or solution. When a large dose (say 10 to 20 grs.) is to be given, by far the

best way is for the physician to order it to be taken in wafer-paper ; 20 grs. may be folded up in a disc of moistened wafer-paper, and swallowed like a spoonful of soft food, without the least inconvenience.

It is not necessary, as is often supposed, to order quinine in solution ; the acid of the gastric juice causes it to be speedily dissolved and admitted into the blood ; and the following agreeable, though not very attractive, formula may be used, and will not be found so bitter as a *solution* of the alkaloid, viz., 30 grs. Quinine Sulph., 1 oz. Tincture, and 1 oz. Syrup of Orange, and 12 oz. water. Dose $\frac{1}{2}$ oz.

Honey and tannin cover the taste of this drug.

The tincture of quinine, in tea-spoonful doses, is an agreeable and effective way to administer small quantities.

The combination of bark with a mineral acid cannot be more effectively produced than in the following excellent tonic :—

R. *Tinct. Cinchonæ* ℥iss.
 Spt. Chloroformi ℥iv.
 Acid. Nitro-Hydrochlor. Dil. ℥iv.
 Syrupi Aurant. ad ℥iv. *misce.*

Fiat mistura, cujus capiat cochlear. i. minim. ex paululo aquæ ante cibos.

Cinnamomum is a warm aromatic, acting as a true stomachic by a gentle stimulating action on the gastric membrane, increasing its secretion and assisting digestion ; hence its use as a condiment. It contains a small quantity of astringent principle, which renders it useful in *diarrhæa* and *pulmonary hæmorrhage*. It also contains some principle grateful to the stomach, which often assists it in overcoming *nausea*, or even *sea-sickness*. The essential oil is a stimulant, and 4 minim doses will relieve *flatulent distention*, and a smaller quantity corrects the *gripping of purgatives*.

Coca and Cocaine—The action of coca leaves, or their alkaloid, when taken internally in small quantity, is stimulating like caffeine, brightening the intellectual faculties, lessening fatigue, quickening the pulse, and *raising the body heat*. In larger doses a group of symptoms like cinchonism is seen, with loss of mental controlling power, giddiness, and unsteady gait. In larger doses the hemispheres, medulla, and cord, at first stimulated, are weakened and finally paralysed. The *sensory columns of the cord* suffering, whilst the motor escape, the

blood pressure falls, the temperature rises, and death results from paralysis of the respiration.

Tumas found that *direct* application of cocaine to the psychomotor centres of the dog invariably produced a fall of their excitability, and when painted over the cerebral cortex prevented epileptic fits. Large doses by affecting the semicircular canals caused peculiar motor disturbances.

Kochs has demonstrated its power of preventing the transmission of sensory stimuli by directly applying it to the sciatic nerve of the frog. After repeated applications the *motor* fibres in the nerve were also finally paralysed.

A few drops of a 4 per cent. solution deprive the conjunctiva of all sensibility, so that squint, cataract, iridectomy, and even the operation of removing the eyeball can be painlessly performed; the range of accommodation is shortened and the *pupil dilates*.

The same remarkable anæsthetic effect is produced when applied to the mucous membranes of the nose, mouth, palate, pharynx, larynx, vagina, os uteri, anus, and rectum. Solutions of various strengths have been used, 4 per cent. for the eye and 20 per cent. for the nose, mouth, and larynx; and $\frac{1}{4}$ gr. injected into the neighbourhood of buboes, inflamed bursæ, small tumours, abscesses, &c., permits them to be painlessly dealt with. Murrell has obtained good results by an inunction of 20 per cent. in oil of cloves over the course of neuralgic nerves. Dr. L. Owen, by mixing an 8 per cent. solution with the official atropine solution, obtains an effective remedy for all *painful and inflamed conditions* of the *conjunctiva* and *cornea*, and Dr. Bradford finds by adding $\frac{1}{2}$ gr. of pilocarpine to 1 dr. of a 4 per cent. solution of cocaine that all the anæsthetic effect is produced without affecting in the slightest degree the accommodation. The hypodermic injection of $\frac{1}{2}$ to 1 gr. relieves and sometimes cures *neuralgia*, and enables the surgeon to perform minor operations painlessly.

For *hay fever*, *pruritus* of the *anus* and *labia*, *vaginismus*, *fissure* and *ulcer* of the *anus*, its use has been followed by relief, and it promises well in aural practice also.

Cocaine probably causes dilatation of the pupil by irritating the endings of the cervical sympathetic distributed to the dilator muscle, as maintained by Jessop. Snell noticed that a pupil dilated by cocaine contracts under the administration of ether and chloroform, which proves that it acts in a way different from atropine, whose mydriatic effect is not influenced by these anæsthetics. Cocaine is antagonistic to morphia, ether, chloroform and chloral, and Obalinski recommends as the safest anæsthetic a combination of cocaine and chloroform; the cocaine being injected locally and the chloroform being given by inhalation. Many alarming symptoms have followed the injection of

even small quantities of the drug. The liquid extract of the leaves is a valuable tonic stimulant and restorative in various forms of *nerve exhaustion*, and some believe that it is a cardiac tonic like *digitalis*.

Fenwick made the curious discovery that the injection of a few drops of a 20 per cent. solution into the urethra relieved facial neuralgia.

A condition known as *cocainomania* results from the prolonged administration of the drug—there is emaciation, quick pulse, loss of memory, sleeplessness, and delusions, for which *nuxvomica* and strong coffee have been recommended.

Coccus—The cochineal insect and its preparations are simply colouring agents, there being no reason to think that tincture of cochineal has any effect whatever in *whooping-cough* or other *spasmodic affections*. Its beautiful carmine colour is turned purple by alkalies.

Codeina — This opium alkaloid possesses feeble narcotic powers. Brunton found that it expended its force upon the nerves of the *viscera*, whose irritability it lessened to such an extent “that after its administration, irritant poisons like arsenic produced neither vomiting nor purging.” It increases the irritability of the spinal and cerebral motor centres. Owing to its power over the visceral nerves it has been found very useful in soothing *the cough of phthisis* and relieving *visceral neuralgias*, and in lessening materially the amount of sugar in the urine in *diabetes* in those cases where, as Bernard pointed out, the glycosuria was depending upon some peripheral irritation of the vagus. Much difference of opinion exists regarding the value of codeine in diabetes, and the weight of authority is strongly in favour of regarding it as a weak morphia.

It has been given with advantage in sleeplessness caused by pain in some peripheral regions, and in nausea, where 2 to 4 grs. may be given every 4 or 6 hours till sleep is produced.

Colchicum in small doses is absorbed, and by the blood is supplied to the different glands in connection with the gastrointestinal canal, which it excites to increased activity, and these effects are produced either by its introduction under the skin or into the stomach; the gastric juice and pharyngeal mucus are increased, and the bile augmented (its salts being more plentiful), and marked increase in the intestinal fluid occurs. In large doses, vomiting, purging, tenesmus, and inflammation result, and death occurs from irritant poisoning—the sensory nerves being paralysed, while the motor nerves are but very slightly, if at all, weakened.

As a diuretic its action is most uncertain, and as a purgative its effects are too severe. Well-marked sedative influence on the

heart and general circulation follows its administration, though this is largely reflex.

In *gout*, striking effects follow its administration, pain subsiding promptly, swelling disappearing, and the attack often vanishing after one or two doses. Some, however, believe that it is in no way curative, the relief being dearly bought, the pain returning with greater severity.

How it acts in these cases of *acute gout* it is not easy to explain, but we know it is not by exerting its purgative or questionable diuretic properties, since its good effects are constantly seen without either catharsis or diuresis being produced, though it acts better in conjunction with purgatives. Yeo believes that in *gout* it acts chiefly on the liver.

Paris noticed that alkalies softened its action, while acids rendered the drug more irritating.

Magnesia makes a favourite corrective. The wine of colchicum is the best preparation for ordinary administration.

It has been advocated in all the protean forms of *gout*, or in almost every disease occurring in *gouty* persons. 15 minims of the wine may be given every 6 hours. The same plan may be adopted in the acute variety of the disease, though a full dose, say 1 dr., of the wine may be given, and repeated in two, three, or four hours while pain lasts.

Colchicum, from its stimulating action upon the liver, may be given advantageously with other *purgatives*, and the addition of a few grains of blue pill and colocynth makes a very valuable purgative for *gouty* patients.

The following is a modification of Scudamore's mixture:—

Rx. *Vini Colchici* ℥iv.
 Magnesii Sulph. ℥j.
 Magnesii Carb. ℥ij.
 Aq. Menth. Pip. ad ℥xij.

Fiat mist. sumat cochlearia duo ampla quartis horis, p.p.a.

Collodium and **Collodium Flexile** are only intended as external applications. When a little is brushed or dropped upon the skin the ether evaporates, leaving behind a thin film impervious to moisture. This contracts as it becomes more solid, until it puckers up the surrounding skin, and, by its pressure, partly empties the vessels of the part. It is generally used as a protective coating for *fresh wounds*, excluding air and all external sources of irritation, putting the wound almost in the same condition as an internal part, thus hastening repair. It is,

however, used for its contractile properties sometimes, as in the treatment of small *nævi*, *port-wine marks*, *entropion*, &c., where it both diminishes the blood in the cutaneous vessels and gives firm support. Dr. M'Keown paints it upon the *relaxed membrana tympani*.

It is found that a layer of collodion possesses *electrical* properties, and thus affords a method of producing feeble doses of static electricity—the film is *negatively* charged as soon as it dries, and it has been used to relieve *hemi-anæsthesia*.

The flexible collodion does not contract so much as the other, but is less liable to crack with the movements of the skin. It is an excellent application to *erysipelatous* surfaces. Corrigan recommended it as a remedy for *nocturnal incontinence of urine*, painted over the child's prepuce at bedtime; and it has been successfully used to cover the face in *smallpox* to prevent pitting, and as an application to *fissured nipples*. It is the best treatment for *scalp wounds*—incised, lacerated, and contused. As it dries, by its contractility it draws the edges of the wound together, prevents the admission of air, and does away with the necessity of a bandage. Collodion has been recommended as an application to sprains, and especially where the sprain is complicated with an open wound. It may be used to paint over the painful joints in rheumatism. The vesicating collodion is an excellent blister.

Colocynthis is an active purgative, causing copious watery motions, whether swallowed or injected; it enters the blood, from which it is eliminated by the intestinal glands, which it stimulates, increasing their secretion, and hastening the vermicular contractions of the bowel, making them painful and irregular. In large doses it acts as a violent irritant to the canal, and may excite fatal inflammation or disturb the functions of the abdominal organs by reflex action, producing abortion, cystitis, &c. It is seldom given alone, on account of its drastic properties, but is a valuable addition to aloes and scammony.

Extract of hyoscyamus greatly relieves the griping caused by colocynth, without detracting from its purgative properties. The compound pill is a valuable purgative in *constipation of long standing*. It acts like aloes on the colon and (in full doses) on the liver, and it is feebly diuretic.

R. *Pil. Colocynth. Co.* gr. iv.

Ext. Hyoscyami gr. $\frac{1}{2}$.

Ext. Belladonnæ gr. $\frac{1}{3}$.

Resinæ Podophylli gr. $\frac{1}{4}$. *misce.*

Fiat pil. mitte tales xii. st. i. nocte.

Conium—The researches of Fraser demonstrate that the discrepancies in the results of the various observations on the action of this drug are owing to the presence of methyl compounds of coniine in the different preparations experimented with.

Hemlock has no action upon the intellectual faculties, the physiological effects begin to show themselves within half an hour after swallowing half an ounce or an ounce of the succus. Vision becomes a little affected by a paralysing influence on the third nerve, which causes slight drooping of the lid, slight dilatation of the pupil, and impaired movement of the eyeball, followed soon by general diminished motor power, as is seen in a wearied, unsteady gait. If a larger dose be now administered, the diminution of motor power is intensified, and the patient is unable to move, the knees bend on standing, the pupil becomes more dilated, and the vision gets more confused.

Still larger doses produce complete paralysis of the *extremities of the motor nerves* extending along their trunks to the motor centres, swallowing and phonation become impossible, and finally death occurs from asphyxia through paralysis of the respiratory apparatus. Owing to the varying amounts of coniine and methylconiine present in different samples of the drug its action is variable, the last named principle causes paralysis of reflex action.

Hemlock has been used in *mania*, *chorea*, and *paralysis agitans*, its value depending on its depressing influence over the extremities of the nerves distributed to the restless muscles. In *whooping-cough* it is also serviceable; in *tetanus* its value is doubtful.

In spasmodic affections, like *laryngismus* and *convulsions* occurring during *dentition*, hemlock may be useful, but it must be administered very freely. The only reliable preparation is the succus, which should be given in doses of 2 to 6 drs. every 3 or 4 hours, and little benefit may be expected till the physiological effects of the drug are noticeable—a slight disturbance of vision and gait. Ringer gave 7 drs. hourly to a choreic child; and children can bear large doses well, as a rule. A child one year old should get more conium in proportion than an adult; 10 minims to begin with is a maximum dose of the succus. It should, however, be rapidly increased, watching the effects. When any difficulty of swallowing is observed, the use of the drug should be suspended.

Hemlock is said to cause the absorption of *effused inflammatory* products; and formerly it was classed on this account as a *solvent*, *deobstruent*, or *absorbent*.

The official inhalation is a doubtful local remedy in irritable conditions of the *larynx*, *bronchial tubes*, and *trachea*, and has been used in soothing the cough and pain in *tubercular laryngitis*, *asthma*, *pertussis*, &c.

Externally, conium is a sedative. The official extract is useless. The writer, after repeated failures with cocaine and a host of local anæsthetics in the relief of rectal pain and itching, caused by *anal fissures*, found that an ointment of conium always gave relief, 10 grs. of the persulphate of iron may be added to each ounce in suitable cases, as recommended by Cripps. The Pharmacopœia authorities having accepted the author's formula in the new Additions, 1890, the ointment is now official and can be easily obtained, and its formula need not be here repeated.

The ointment appears to paralyse the endings of the *motor* nerves distributed to the fine muscular layer under the surface of the mucous membrane ; the reflex twitchings of this layer keep up the perpetual pain and uneasiness in diseases of the rectum and anus associated with abrasions, ulcerations, or fissures. At the same time the sensory terminals are paralysed.

This will be found by far the best remedy for the pain of *fissures* and *ulcerated hæmorrhoids*, and the writer has seen anal fissures heal under its use. It should be inserted well up into the bowel.

Copaiba acts as a mild irritant to the stomach, and in large doses excites nausea, vomiting, griping, purging, and sometimes strangury, with bloody urine. It acts on mucous membranes only, and it is mainly for its effect upon the urethra that it is used in medicine.

Given in *gonorrhœa*, it at first slightly increases the flow, and afterwards controls it. It may act by destroying the specific poison which causes the inflammation. It is eliminated by the kidneys as glycuronic acid, which gives a precipitate with nitric acid, which is soluble by heat ; and it is eliminated also by the bronchial membrane and skin—all of which excretory organs are stimulated by it. It increases the watery element in the urine, and is used sometimes as a diuretic in dropsies of hepatic origin, but it may produce albuminuria and is very irritating.

It acts by direct contact in *gonorrhœa* and *gleet*, and the writer has found benefit from injecting it into the bladder in *inveterate cystitis* in the female. He dilutes it with its own bulk of warm castor oil, and injects 1 oz. of it, allowing it to remain until expelled. In *acute inflammations of the bladder or urethra*, copaiba often aggravates if given too early. Warm water injections should be used for two or three days at first. It should not be given in larger doses than 30 minims, and often this dose upsets the stomach.

In *chronic bronchitis*, with profuse expectoration, copaiba often acts splendidly, and will be found in such cases the most reliable of the oleo-resins. It is occasionally used in *leucorrhœa*, and has been known to remove *psoriasis* which resisted all remedies. Its administration sometimes brings out a profuse

rash not unlike measles, or urticaria, and this probably gives some explanation of its use in psoriasis, acting as a stimulant to the skin. It may be given alone, in water, or in the form of an emulsion with mucilage, egg, or liquor potassæ, or in a gelatine capsule, or better still, as a paste. (See under Cubebs).

(*Gonorrhœa Mixture.*)

℞. *Copaibæ* ℥vj.
 Liq. Potassæ ℥iv.
 Mucilaginis ℥j.
 Spt. Æther. Nit. ℥iij.
 Aquæ Cinnamomi ad ℥viiij. *misce.*

Fiat. mist. capiat cochlear. i. mag. ter in die. p. p. a.

Coriandrum—An aromatic carminative, identical in its effects with Anethum and Anisum. 4 minims of the oil may be given on sugar, for *colic*.

Creasotum possesses many properties in common with Acid. Carbolic. (which see.) It is speedily absorbed on entering the stomach, and does not undergo any marked change in the blood. It is eliminated by the bronchial mucous membrane, which it stimulates, thus becoming an expectorant especially valuable if there be any fetor of the secretion. In full doses it is the most valuable remedy in *chronic basilar cavity*. Recent reports speak strongly of the internal administration of creasote in pulmonary, abdominal and laryngeal tubercular disease. The writer is satisfied that it is the best of all agents in ordinary *phthisis*. See also Guaiacol. It also passes off in the urine, and is believed by some to be diuretic, though this action is only to be relied upon in doses which are bordering upon dangerous. In very large doses it is a violent irritant poison, resembling carbolic acid, only it does not produce convulsions, and does not render the blood less coagulable,

Small doses have a sedative action upon the terminal nerve filaments distributed to the gastric mucous membrane, and correct *nausea*, *gastralgia*, and *vomiting*, whether caused by local mischief or of a reflex character, as in *sea-sickness* or *pregnancy*. 2 or 3 minims frequently arrest *fermentative* and *putrefactive changes in the stomach*, for creasote, like carbolic acid, is a powerful antiseptic. It may be given in pill or in a mixture, and it is to be remembered that it explodes when combined with oxide of silver in the pilular form, unless it is previously diluted with some inert powder. But the gelatine capsule is by far the best

form for its administration. Externally, it acts like carbolic acid, and relieves the pain of an *exposed dental nerve* effectually; and in the form of the ointment it is useful in *ulcers* and the *scaly skin diseases* where tar is indicated, and it relieves the itch of *eczema*. As an inhalation in *chronic bronchitis* and *gangrene of the lung*, creasote is beneficial.

Creta and Creta Præparata are mild antacid remedies, useful where we wish to reach the *intestinal* surface with an alkali. (Their action is explained under Calcium Carbonate.) The aromatic powder is a valuable remedy in the *diarrhæa of childhood*; it may be given as a powder or in a mixture.

(For a child 4 years old.)

Rx. *Pulv. Cretæ Aromat.* ℥ij.
 Syrupi Simplicis ℥j.
 Spt. Chloroformi ℥j.
 Aquæ ad ℥iij. *misce.*

Fiat mist. sumat cochlear. i. minim. tertiis vel quartis horis, p. p. a.

Crocus—Saffron may be said to be only used for its colour and flavour. It was much esteemed long ago as an emmenagogue, and was believed to possess the property of increasing the rash in the *exanthemata*.

Croton Chloral (See Butyl Chloral Hydrate).

Crotonis Oleum is a powerful drastic or irritant cathartic, causing copious watery motions often in less than one hour after a medicinal dose. It does not act entirely as a local irritant to the intestines, as was supposed, but a part of it may be absorbed, and entering the blood, circulates with it till it reaches the intestinal glands, which it stimulates to increased action, and it quickens the peristaltic movements. The same effects sometimes follow its application to the skin with friction as are observed after swallowing it. In large doses it is a violent poison, acting as a local irritant, and causing inflammation of the digestive tract, or death from collapse. Its rapid and generally certain action renders it a valuable purgative, where time is a consideration, as in *head injuries*, *acute mania*, *delirium tremens*, and *brain disease*, and in very *obstinate constipation*, when we are sure the lower bowel is freed by enemata. It may be given in pill, i minim acting as an efficient cathartic; or in *apoplexy*, it may be dropped on the tongue, when power to swallow is blunted or

of dividing the action of digitalis and its close allies into 4 stages, thus :—

1. Increase of cardiac pulsation, slowness of pulse, and rise of blood pressure.

2. Quickness of pulse (effect on cardiac vagus filaments), continued high blood pressure, and increase of urine.

3. Irregularity of heart and pulse (effect on cardiac muscular fibre).

4. Increased irregularity and weakness of heart and pulse, fall of blood pressure, failure of heart and respiration, and death.

Brunton asserts that the main cause of the increased blood pressure is not to be accounted for by the increased action of the heart, but by the *contraction of the arterioles* throughout the body. It acts as a diuretic mainly by raising the blood pressure in this way ; its diuretic action is, however, slight in health but marked in heart disease.

Digitalis, on account of its strengthening action on the heart, may be given in all cases of *weakened contraction from valvular disease except one*. It acts in valvular disease by slowing the heart's movements, so that the overburdened ventricle or auricle gets longer time to contract, and thus more effectually drives the blood through a narrowed orifice. In the case of *mitral obstruction* the time during which the blood flows from the distended auricle into the ventricle is increased, and when the former contracts it has less to expel, and hence does its work better. The exception to its use is in the *early stage of aortic regurgitation*, where, after each contraction of the heart, the blood, which should be forced along the aorta, finds its way back into the wearied ventricle, breaking upon its repose. If the diastole is prolonged by the digitalis, the duration of this backflow is increased, the mischief is aggravated, and grave danger may result. Later on, however, when the pulmonary circulation is affected, and through it the right ventricle becomes implicated, digitalis may afford relief. Sansom lays down a law which should never be forgotten—that all agents which increase the force of the systole are *invariably* hurtful in aortic disease without cardiac symptoms. It should not be given in extensive atheromatous disease of the vessels, nor when there is much fatty degeneration of the heart muscle. Ringer points out that “the irregularity of the pulse is the capital indication of the necessity of giving digitalis,” and it is often valuable in palpitation and irregular action of the heart not depending upon valvular disease.

Sansom says : “Digitalis is *facile princeps* of drugs in the treatment of imperfect compensation. It so influences the cardiac ganglia as to induce a more perfect contraction of the ventricular muscle, and hence a more complete emptying of the ventricles ; whilst, at the same time, by an action on the vaso-

motor centre, it causes contraction of the arterioles and a heightened tension in the arterial system. It slows the heart by lengthening the diastolic pause ; so not only does it give rest to the wearied cardiac muscle—but as this muscle is nourished only during such diastolic pause by the blood which then enters through the coronary arteries it directly ministers to its nutrition."

$\frac{1}{2}$ oz. doses of the tincture have been used in *delirium tremens* ; this is not a method of treatment to be recommended. In *pneumonia* the drug is of great value, combined with other treatment. It reduces the temperature in *inflammatory conditions*, and as an antipyretic is still occasionally used on the Continent.

It is used in *internal hæmorrhages*, because of its contracting influence upon the arterioles, but it is very uncertain. It causes contraction of the *uterine muscular tissue*, and is useful in *menorrhagia*.

In disease, the diuretic effects of this drug are often astounding. Given to relieve the *kidneys*, where many quarts, or even gallons, of fluid are shut up in the peritoneal cavity or thorax, from an obstructed cardiac circulation, it has been seen to increase the scanty urine from several ounces to as many pints in twenty-four hours. In these cases it acts by striking at the cause of the dropsy, through its power of raising the blood pressure in the renal glomeruli. Kobert shows that *Digitalin* contracts *all* the vessels, and *Digitoxin* and *Digitalein* whilst also contracting all the other vessels, dilate those of the kidney. Hence *tincture* of digitalis, which contains the three substances is the best known diuretic. These substances also exist in the *infusion*, though in smaller proportions, it contains much *Digitonin*, which is antagonistic to the others ; the infusion is preferred where cardiac tonic effects are desired.

After the disappearance of the dropsy it has very slight power of increasing the amount of water or urea eliminated.

Digitalis, when administered for some time, occasionally without warning, produces symptoms of poisoning as if one large and dangerous dose had been taken. This is spoken of as the *cumulative* action of the drug, and it arises from its elimination by the urine being retarded. When the blood pressure rises very high the excretion of urine stops and the drug consequently accumulates rapidly in the blood. This may be prevented by keeping the patient strictly confined to the recumbent position, watching the urine and stopping the administration when the secretion becomes scanty.

Externally, an infusion applied to any extensive surface is sometimes absorbed.

Baly's or Guy's pill, which usually is made to contain 1 gr. each of powdered digitalis, squill, and blue pill, is a favourite diuretic in *cardiac dropsy*.

Niemeyer's pill, much used in *phthisis*, contains $\frac{1}{2}$ gr. digitalis, 1 gr. quinine and $\frac{1}{4}$ gr. opium; and Heim's pill is the same with the addition of $\frac{1}{4}$ gr. ipecac.

Iron, though incompatible with the tannin in digitalis, is often prescribed with advantage, the following formula gives a clear elegant mixture :—

Rx. *Tincturæ Ferri Perchlor.* *ʒiij.*
 Tincturæ Digitalis *ʒij.*
 Acidi Phosphorici Dil. *ʒiij.*
 Aquæ Destillatæ ad *ʒviiij. misce.*

Fiat mistura, sumat ʒss. ter in die ex aqua post cibos.

Elaterin, Elaterium, and Ecballii Fructus—The latter is only used to prepare elaterium, from which the active principle elaterin is obtained, which is the most violent purgative known. Belonging to the hydragogue class, it produces profuse watery evacuations by its stimulating and irritating action on the liver and intestinal glands, by which it is eliminated. Externally, it is a strong irritant to moist surfaces.

In the treatment of desperate conditions—like *apoplexy*, &c. — $\frac{1}{10}$ grain will draw off as much water and serum from the blood as a copious blood-letting. The $\frac{1}{20}$ grain is a good average dose, and, owing to the discharge of water produced by it, it is useful in *dropsies*, or in accumulation of fluid from any cause, especially where the kidneys are congested or fail to do their office, and the heart is not too weak. Its great use lies in its application to cases of formidable and *sudden anasarca*, threatening life by its rapidity, as in *œdema of the lung*.

5 grs. of the compound powder, put on the tongue and washed down with a spoonful of water, should purge in a few hours.

Kohler states that it requires bile to be present for its purgative action, and if injected under the skin, Brunton says it produces *dyspnœa* and *tetanus*. The student should note the dose of elaterin— $\frac{1}{20}$ grain—while elaterium may be given in 10 times this quantity. The writer has sometimes found elaterium to fail completely even in large doses. It is uncertain in its action, and must not be always relied upon.

Elemi is a mild stimulant when applied externally, causing feeble inflammatory action in the skin. The ointment may be used as a dressing for *indolent* and *sluggish ulcers*.

Emplastra—The plasters of the Pharmacopœia are chiefly used for their physical quality of adhesiveness. By strapping so that a grip can be obtained on the surrounding elastic tissues, considerable pressure can be constantly kept up, and in this way *inflammatory products* may be absorbed, especially if of *syphilitic* origin, the ammoniacum and mercury, or the mercury plaster, answering this end very well. *Pain* may be relieved by the belladonna or opium plasters, while feeble counter-irritation and active rubefaction may be produced by calefaciens and cantharides.

With the exception of cantharides, all the plasters promote the absorption of superficial inflammatory deposits by protecting the part from variations of temperature. By checking evaporation the local temperature is increased, and the superficial part partakes somewhat of the benefits of an internal position, and glandular and lymphatic action become altered in some way, as is seen in the resolution of *chronically inflamed glands and joints*.

Enemata (See under Aqua, page 351.)

Ergota, owing to the complex nature of the various active principles contained in ergot and the great difficulties in isolating them, experiments conducted with them have led to confusing and contradictory results. It has been noticed that where ergot has been taken for any time in the rye-bread used by peasants, *gangrene* and *paralytic symptoms* have supervened, though these are rarely seen after the prolonged medicinal use of the drug. Large doses of ergot cause vomiting and purging, paralysis of the sensory nerves, inco-ordination, muscular spasms and convulsions, and death through paralysis of the respiratory centre.

In moderately large doses ergot causes contraction of the involuntary muscular fibre throughout the body, the arteries and veins diminish rapidly in calibre, and the vessels of the spinal cord are more especially contracted; there is a fall in arterial pressure, soon followed by a marked rise, but this rise does not occur in poisonous doses. The heart is little affected by moderate doses, though the pulse falls a little, but the uterus is powerfully influenced, and the arterial tension being raised in the glomeruli of the kidney, ergot acts as a diuretic, and at the same time assists the contraction of a weakened bladder.

Ergot is used in *internal hæmorrhages*, 20 minims of the liquid extract every three hours relieving *hæmoptysis* by constringing the small vessels. In *urgent* cases the same amount may be injected under the skin every fifteen or thirty minutes. It is useful in all *hæmorrhages*, and sometimes, by acting upon the muscular walls of the intestines, it stops *diarrhœa*. The hypodermic injection of ergotine has proved effectual in curing *goitres*

and *aneurisms* when injected into the tissue surrounding the sac, and in the same way it diminishes *fibroid tumours* of the uterus, and it has been recommended in *purpura* and excessive sweating, in *dysentery*, enlargement of the spleen, and congestion of the spinal cord.

Savitski insists upon the action of ergotine and quinine being identical, and he uses ergotine in *ague*.

It is, however, in *obstetric practice* that the virtues of ergot are appreciated. By acting on the uterine fibres it produces powerful tetanic contraction, and assists to expel the contents of the organ. 30 grs., infused for ten minutes in boiling water, will often arouse the slumbering energies of the uterus within five or ten minutes, but its administration requires discrimination: thus, it should not be given if there be any impediment to the descent of the head, or if the pains are already good; and sometimes it exerts dangerous pressure upon the child by its tonic action on the uterus.

It may cause irregular action of the muscular tissue and retained placenta. It acts proportionately to the size of the uterus. In the early months of pregnancy it feebly affects the organ, but its power over it increases with every month of gestation. It is the best remedy we have for the relaxed condition, causing *post-partum* hæmorrhage, where it may be given in dr. doses, or 10 minims of the hypodermic injection may be injected *deeply* into a muscle or into the uterine walls in desperate cases. *Subcutaneous* injection is more likely to be followed by irritation and abscesses. The obstetric practitioner will find the fresh infusion the best preparation, and where he resides a long way from his patient, it is a good rule to never leave a recently-delivered case without previously giving ergot. Good results follow its use in *sub-involution* and *menorrhagia*, and various forms of *uterine fibroid tumours*. For *fibroids* Schucking injects ergotine, by a disinfected syringe, into the lip of the os uteri. Most authorities agree that the abdominal wall must not be selected, and that the deep muscles of the buttock afford the best spot. The solution should be always freshly prepared.

In *prolapse of the rectum*, Vidal injects 3 grs. ergotine into the sphincter or prolapsed bowel every two or three days.

Eserine—(See under *Physostigma*.)

Ether—(See under *Æther*.)

Eucalyptus Oil is a powerful antiseptic, destroying minute organisms. In some respects its action resembles quinine, thus it arrests the movements of the white corpuscles and causes the spleen to contract. In large doses it paralyses the brain and cord, causing death generally by its action on the respiratory centre. Externally it is a rubefacient, and if covered with oiled

silk it will blister. It is given in feverish septic conditions, and good results have followed its use in *puerperal fevers*, *pyæmia*, and *septicæmia* in 5 minim doses. It reduces the temperature, and has proved curative in *ague*, and during its elimination by the bronchial mucous surface and the renal tract, it is a disinfecting expectorant in *phthisis* and *bronchitis* and in *cystitis* and *gonorrhœa*. It has been given hypodermically in liquid vaseline. Many physicians are now treating all the *exanthemata*, *pertussis*, and *diphtheria* by enveloping the patient in an atmosphere of eucalyptus vapour. In *influenza* this has become the popular practice. Gurgenvén has recently reported most favourably of the surprising results of this method of treating *scarlatina*.

Locally the vapour has been used as an inhalation in *gangrene of the lung*, *phthisis*, *ozæna*, *diphtheria*, and a dilute solution is employed to wash out cavities and *irrigate foul wounds*. Made into a pessary, it has been used in *cancer of the uterus and rectum*, and as a gauze it is used as an antiseptic surgical dressing.

Eucalyptus gum is an astringent acting like catechu and tannin in *diarrhœa*, *dysentery*, &c. It is used also for *relaxed throat* and in *hæmorrhoids*.

Euonymus and the dry extract known as Euonymin are cholagogues increasing materially the excretion of bile. It is a reliable cathartic, in some respects resembling podophyllin but very much milder in its action. The experiments of Rutherford proved that it increased the amount of bile flowing into the intestine of dogs. Its chief indication is in *torpidity of the liver* in stout patients who live too well. In the early stages of *cirrhosis* it is useful, and some cases of *chronic constipation* yield to 1 gr. doses twice a day. 5 grs. may be given as a brisk purge, followed if necessary by a saline.

Farina Tritici—Wheaten flour is too well known as a valuable food to require mention. It is used in medicine as an external application in *erysipelas*, where it acts as a simple protective by excluding the air and keeping up an even temperature. A table-spoonful of flour swallowed in a tumblerful of cold water, morning and evening, is stated on very good authority to check the growth of boils.

Fel Bovinum Purificatum is employed in medicine where there is reason to suspect that the natural secretion of bile is deficient; the bile is known to assist the emulsification of fats, to act as an antiseptic and purgative, and to facilitate the absorptive powers of the mucous membrane. It may be given in 30 gr. doses as a bolus, or wrapped in wafer-paper.

Ferrum—Iron must to some extent be considered as a food, but if given in medicinal doses it cannot be so regarded. In health it does not increase the number of the red corpuscles, but

appears to act directly as an ozonising agent in large doses. It increases the appetite somewhat, and if the astringent preparations be administered constipation results ; in any case the stools are black, and sometimes the bladder is irritated. None of these effects throw any light upon the action of the drug in disease. It is, beyond all doubt, a most valuable tonic to the whole system. It directly affects the blood in *anæmia*, increasing the red corpuscles, and thus enriching nearly all the tissues with an increased supply of oxygen. The brain and nervous system benefit by this ; their tone rapidly improves, and hence its great value in *exhaustive mental overwork* and *neuralgia* where iron is a tonic in the true sense of the word. In recovery from *fevers*, especially in cases where there has been *much brain activity* or *prolonged delirium*, the use of iron is often attended with the best results.

Iron acts by combining with the hæmoglobin of the corpuscles, and under a course of iron rapid improvement in the condition of the blood may be demonstrated every few days by the use of the microscope.

Bunge maintains that in *chlorosis* the inorganic iron administered does *not* go to form hæmoglobin, and that the iron used up comes from the organic iron in the food. Charles thinks that the inorganic iron salts when administered protect the organic salts existing in the food from being split up in the alimentary canal as they are supposed to be in chlorosis.

The soluble salts of iron are absorbed as chlorides probably in large amounts, and are, after passing through the liver, eliminated by the bile and by the intestinal secretion, passing out by the fæces in almost as large amount as when swallowed, though some authorities believe that the iron salts are not absorbed at all and never find their way into the blood.

The action of iron is too often regarded as merely restorative, supplying to the blood a scanty constituent ; the writer believes that it most probably acts by improving the assimilative powers in the liver. The best results follow the administration of large doses of the tincture. It would occupy much space to mention the ailments for which iron is so highly praised, but many will be included by saying that in *anæmia*, from whatever cause, this drug may be freely given. It seems to possess specific power over *erysipelatous inflammations* when taken in large doses, and in *chlorosis* and *scrofula* its effects are nearly as evident.

Externally, the perchloride is a powerful astringent, and the strong solution acts upon the blood-vessels, and hardens the tissues. It is a valuable last resource when injected into the uterus in *post-partum* hæmorrhage, if reduced to about the strength of the diluted solution of the B.P. The solid crystalline

mass obtained by evaporating the liquor can be easily carried in the obstetric bag and (on adding 1 to 10 of water) may be injected into the uterus.

The scale preparations are favourites, especially the citrate with quinine, which, however, cannot be ordered with alkaline carbonates.

R. *Ferri et Quininæ Cit.* ℥ij.
 Spiritus Chloroformi ℥ii.
 Inf. Calumbæ ad ℥x. *misce.*

Fiat mist. st. coch. i. mag. ter in die.

The citrate may be given in effervescence, and makes a most elegant and palatable chalybeate mixture.

R. *Ferri Ammon. Cit.* ℥ii.
 Acidi Citrici ℥iiss.
 Aquæ (or Aquam) Destil. ad ℥vj. *misce.*

Fiat mist. st. coch. i. mag. ter in die cum coch. ii. mag. mist. alkalin. dum effervescent.

(Alkaline Mixture for the above.)

R. *Potassii Bicarb.* ℥v.
 Spt. Chlorof. ℥ij.
 Aquæ (or Aquam) ad ℥xij. *misce.*

Signa, "Alkaline Mixture."

Iodide of Iron will be found invaluable in *struma* and *syphilis*, and in the form of the syrup is well suited to the taste of children.

(For a child two years old.)

R. *Syrupi Ferri Iod.* ℥iij.
 Olei Limonis gt. iv.
 Syrupi ad ℥iv. *misce.*

Fiat mist. capt. coch. i. min. ter in die.

The pill of iodide of iron, as ordered in the Pharmacopœia, is objectionable on account of its instability. Blanchard's pill, about the same strength, is decidedly superior.

Tinct. Ferri Perchlor. is, perhaps, the best and most used preparation of iron. It cannot be given with alkalies. If ordered with substances containing tannin, like digitalis and ergot, the mixture can be made bright by the addition of a little Acid. Phosph. Dil.

Glycerine is the best corrective to order with the liquid iron preparations, and makes a much more agreeable mixture than if spirit of chloroform be used, though the latter prevents the iron from causing any gastric irritation, and is sometimes retained when the stomach rejects more elegant combinations.

The *dialysed iron solution* is the least irritating and objectionable of all the iron preparations, and its hæmatinic qualities are unmistakable. It may be also used as an antidote to arsenic.

The syrup of phosphate of iron is useful in the dyspepsia of anæmic patients. It should be ordered by itself.

The *Mistura Ferri Co.* has long maintained its supremacy amongst the iron preparations as a remedy for *absent or scanty menstrual discharge*. If its position is well deserved, it is certainly by producing the maximum of good with the minimum of iron, as it is often in a decomposed condition before being swallowed by the patient.

The *Mist. Ferri Aromat.* is seldom ordered. Though an inelegant, it is a valuable chalybeate.

The *Saccharated Carbonate* is a very agreeable form for giving iron.

The *Sulphate* is a good tonic and astringent, and is a valuable addition to purgatives. It enters into Blaud's Pill, but the iron becomes changed into carbonate, and it is now one of the most frequently ordered of all remedies for *amenorrhœa*. In this form it does not cause constipation; 9 pills may be given in the day.

If a plain chalybeate is required without astringency, in the *Ferrum Redactum* such will be found.

Rx. *Ferri Redacti* gr.c.

Mannæ q.s. ut fiat pil. xx.

St. i. ter in die post cibos.

Ficus—The fig is nutritious, and acts as a mild laxative. When taken in large quantities it causes griping, probably by the presence of the indigestible fruits, or so-called seeds, irritating the mucous membrane, and setting up irregular and painful contractions. Split open and heated, figs make a popular emollient poultice.

Filix Mas is used as a remedy for *tænia solium* and *bothriocephalus*. It should be given to an adult in 60 minim doses, early in the morning, after a previous castor oil purge administered at bed-time, to insure the complete emptiness of the bowels; or it may be given at night, after fasting, and be followed by a purge next morning. Care should be taken to look for the head of the worm, for until this is obtained there is doubt of its destruction. The fern seems to act as a direct poison to the parasite. It has also been given in *cholera*. It may be combined with turpentine, or given in capsules.

The ordinary dose of 30 minims is generally useless.

Rx. *Ext. Filicis Liq.* ʒj.
 Spt. Terebinth. mxxxv.
 Ovi Vitelli i. misce et adde
 Aquæ et Syrupi q.s. ad ʒij.

Fiat haustus, mane sumendus.

Fœniculi Fructus—Fennel acts like *Anethum* (which see). In addition to its aromatic qualities, it is supposed to have the power of increasing the flow of milk. The water is a favourite antispasmodic for infantile colic, in tea-spoonful doses for a child 1 year old.

Galbanum resembles *asafoetida* in its action, only it is feebler. It is a stimulating expectorant. Externally the plaster is a mild stimulant to indolent *glandular enlargements*.

Galla—Since the value of galls depends upon the tannic and gallic acids contained in them, the reader is referred to *Acid. Gallicum*.

Gelatinum is only made official in order to obtain a basis for glycerine suppositories.

Gelsemium—Full doses produce giddiness, double vision, dilatation of the pupil, ptosis, numbness of the fingers, and a peculiar expression of countenance, chiefly owing to loss of power of the ocular and facial muscles.

In poisonous doses the patient becomes unable to articulate or walk, a peculiar tremor of the head is noticed, sensibility is impaired, the pulse becomes quick and finally cannot be felt, the respiration is slow, the motor and sensory columns of the cord are depressed, and paralysis of all the muscles in the body follows, and the temperature falls. The writer found a patient clinging to a lamp-post in the street with most of these symptoms well marked after two doses of 1½ gr. each, of the B.P. alcoholic extract.

will prove a good remedy for this troublesome parasite. Many authorities maintain that it is the best of all remedies. The drug itself acts in large doses as a cathartic.

It owes its virtues to two alkaloids, and splendid results have followed the administration of these active principles known as Pelletierines.

Guaiacum once held a high position as a remedy for *syphilis*. The only effect certainly known to follow its administration is that of a mild diaphoretic and emmenagogue. Sawyer gives 10 grs. of the resin before breakfast for *amenorrhœa*, and 1 dr. of the ammoniated tincture every 2 hours in *dysmenorrhœa*. It seems to have some power in relieving the wearying pains of *chronic rheumatism*, and it was an important constituent in the famous "Chelsea Pensioner"—an electuary consisting of the following—and found useful in the rheumatic and gouty complaints of *old people*:—

(*Chelsea Pensioner.*)

Rx. *Guaiaci Resinæ* ℥j.
 Sulphuris Sublimati ℥ij.
 Pulveris Rhei ℥ss.
 Pulveris Sinapis ℥ij.
 Potassii Nitratis ℥ss.
 Mellis vel Theriacæ q.s. misce.

Fiat electuarium, st. 5i. mane nocteque.

The ammoniated tincture of guaiacum has been strongly recommended in *acute tonsillitis* in half-dr. doses in sherry. The mixture and powdered resin are better preparations.

Gutta Percha is only used for its physical qualities; a solution in chloroform making a protective covering like collodion, for *excoriations*, and it is employed to prevent *pitting in small-pox*. Coloured with a little chalk or calamine, this solution is useful when painted over the sutured line, instead of plaster, after *post-mortem* examinations. When neatly applied, the line of incision is hardly noticeable. Under the name of "Traumaticine" the solution has been praised by Auspitz, who uses it in many *skin affections* as a protective covering. It affords a good method for the local application of chrysarobin in *psoriasis*.

Hæmatoxyli Lignum—Logwood is a valuable astringent and tonic, acting like tannin. The extract, which is a hard solid, when dissolved in water will be found the most certain

and reliable astringent in the *diarrhœa of tubercular ulceration* and the inveterate *diarrhœa of childhood*.

R. *Ext. Hæmatoxyli* ℥iij.

Tincturæ Opii ℥. lxxx.

Misturæ Cretæ ad ℥iv.

Fiat mist. cpt. coch. ii. min. post singulas dejectiones liquidas.

Hamamelis has long been used by the Indians of North America as an astringent. In *epistaxis*, *hæmatemesis*, *hæmoptysis*, *hæmaturia*, *menorrhagia*, and especially in *hæmorrhage from piles*, it has checked bleeding. In what way it acts is by no means certain, as it is not very rich in the ordinary astringent principles—tannin, &c. It acts both locally and constitutionally, but it is chiefly for its local action that it is most used. 1 part of the tincture, with 20 of water makes a lotion for *wounds* and *ulcers*, or an injection for bleeding or ulcerated *piles*, which can be easily retained. It also is used in *gonorrhœa*, *leucorrhœa*, &c. In all cases it is wise to administer it internally as well, in 5 minim doses 3 or 4 times a day. There is an extractive known as Hamamelin, the dose of which is about 1 gr. in pill, and Burroughs, Welcome & Co. have introduced an elegant distilled liquid extract, the dose of which is about $\frac{1}{2}$ dr.; it is known as Hazeline. They have also recently introduced an ointment, made with the active principle and lanoline, which the writer has found successful as an astringent and anodyne to pained and bleeding *hæmorrhoids*. Hamamelis is not toxic, and no very definite action upon the vascular system can be demonstrated by experiment. Dujardin-Beaumetz believes it has a specific effect upon the muscular fibres in the coats of the veins. It has been extolled as a remedy in *dysmenorrhœa*, relieving pain and languor and producing a comfortable feeling of exhilaration. Brunton found it in some cases of *hæmoptysis* to be more efficient than either ergot or digitalis. The writer has used it as a local application to varicocèles and varicose veins with apparent success in some cases, and as an enema (1 oz. Hazeline) in bleeding *hæmorrhoids*.

Hemidesmus is supposed to act like sarsaparilla. It is a feeble stimulating diaphoretic, and is used as a remedy for *sypilis* in India. Possibly the fresh plant has some power, for the dried herb seems to have none.

Hirudo—Leeches are used to extract blood in local inflammations, and good healthy specimens may be calculated to remove two drachms each. It is a good plan to apply them

when possible over such prominences as will permit of a gentle pressure being applied in case of excessive hæmorrhage from their bites. In applying leeches they should never be touched by the fingers of the nurse or attendant. The physician should order the dispenser to send them in a perfectly clean chip box, which should only be opened as the affected part is exposed; and the inversion of the box (which should be steadily pressed against the skin till they fasten) is all that is generally necessary. The part should be very clean, and free from all traces of soap, mustard, &c. If the leeches refuse to bite, which is seldom, a little sugar or cream, or better still, the minute scratch of a needle, determines the point. They should not be pulled off after their feast, but should be allowed to drop; if, however, it is necessary at any time to remove them, a little salt sprinkled over their backs acts as a brisk emetic, and they drop off at once.

Should further bleeding from the bites be required, a hot poultice or fomentation may be applied, or a cupping-glass may be put over the bites; this latter is an excellent plan. A pad of wool or gentle pressure with the fingers will easily restrain the hæmorrhage; but occasionally perchloride of iron must be used, or even a hare-lip needle, with a figure of 8 thread, may be required. Matico leaf or puff-ball will, however, answer all purposes.

The extraction of blood by leeches should not be recommended in extensive inflammations, for if the system is to be affected it can only be by opening a large aperture and *rapidly* removing a fair quantity of blood in a short time. By the *absolute* rejection of venesection, therapeutics loses a valuable remedy. The writer has twice seen life apparently flow in as the blood ebbed out. It is in cases of *engorgement of the pulmonary vessels*, following severe chest injury, and threatening imminent suffocation, that by boldly striking into a large vein life will be saved. He has followed this course in a hopeless case of *submersion*, where death was apparently rapidly approaching. The systemic veins and pulmonary circulation were engorged, and the burdened right ventricle threatened momentarily to cease its almost ineffectual contractions. By making a *free* incision into the median basilic the inspiration became gradually slower, and the heart, eased by the relief of the systemic circulation, commenced to beat strongly, the patient appeared to be suddenly snatched from death, and made a speedy recovery. In such a case death would probably have occurred from suffocation, even had the patient's body been covered with leeches.

Homatropine acts like atropine and produces mydriatic effects, weaker, but preferable to those obtained by that drug.

Discs or a few drops of a (4 grs. to 1 oz.) solution dilate the pupil and paralyse accommodation, the paralysis disappearing in 24 and the dilatation in 48 hours ; whilst the effects of atropine generally last for several days. It has been used internally in cases where atropine is indicated.

Hordeum Decorticatedum — Pearl barley is a nutritious food. It is used for the preparation of the decoction, which makes an agreeable demulcent drink in *febrile conditions*, and serves to dilute cow's milk for bottle-fed children.

Hydrargyrum was in its metallic state formerly employed in very large quantities to open the bowels by mechanically driving the contents before it as it gravitated towards the anus.

Inhaled as a vapour, or used as a fumigation, the metallic mercury is active ; swallowed, rubbed into the skin, or injected hypodermically, or applied endermically, mercury and its salts produce marked constitutional effects. If only a minute quantity be administered, and for a short time, there will be an increase in the number of the red blood corpuscles, a general improvement in the circulating fluid, and an increase of body weight. If the minute doses be indulged in for a longer period, or if the quantity be increased, the blood loses in fibrin and red corpuscles, and becomes charged with excess of waste products ; a brassy taste is felt in the mouth ; the gums swell, and are marked with a blue line ; the teeth are tender ; the salivary secretion is increased ; and fetor of the breath is noticed. The spongy gums soon ulcerate ; the salivary glands enlarge ; and as the metal is eliminated, it stimulates all the glandular apparatus—cutaneous, salivary, intestinal, and renal—by which it is thrown out ; nervous tremors and disorders of co-ordination appear ; emaciation, prostration, and finally death will occur. These symptoms follow the administration of any mercurial preparation in small doses.

The *inhalation* of mercurial fumes, as seen amongst mirror makers and others, often produces symptoms confined to the nervous system. This form of chronic mercurialism is known as "Mercurial Palsy." There is tremor of the muscles of the extremities and head, not unlike *paralysis agitans*.

Calomel, mercurial chalk, or blue pill are the preparations administered when we wish to get the physiological effects of mercury ; the red iodide and corrosive sublimate being violent irritants, causing death like irritant poisons. The salts of mercury are dissolved in the stomach or intestines, and find their way into the blood as albuminates, and in their passage out exhibit their selective action, chiefly on the salivary glands, and it is supposed also on the pancreas.

Exaggerated ideas of the dangerous results of mercury upon the system have arisen, probably because in disease the use of the drug has been generally pushed too far. We know now that it is entirely unnecessary to produce the above effects in order to treat a disease by mercury, and it is evident to those who closely watch the effects of mercury upon children that they will improve and grow fat upon it even for a long time, if judiciously administered.

Internally, mercury has been generally given (1) to control acute inflammation, or (2) to cause the absorption of inflammatory products, or (3) to combat the poison of syphilis.

There are, moreover, various groups of symptoms for the dispersion of which mercurials are used. The *diarrhœa* and obstinate *vomiting of children* often yield to minute doses— $\frac{1}{10}$ gr. of calomel every hour. A group of symptoms, known popularly as *biliousness* in the adult, is frequently dispersed by a good dose of calomel or blue pill, which, by removing all sources of irritation in the intestines, relieves an over-loaded liver, or remedies a catarrhal condition of the bile ducts; calomel acts as a purgative—not by stimulating the liver to secrete more bile—but by irritating the duodenum, so that the bile is swept down the canal before time is allowed for its absorption. There is thus really less bile circulating with the blood after a dose of calomel (which causes free purgation) than there was before. Few now advocate the use of mercury in *acute inflammations*, excepting in the case of *iritis*, and it is seldom employed to cause the absorption of effused products, though it is strongly maintained by a few that it controls *meningitis*, and assists the absorption of fluid effused within the cranium. In *meningeal inflammations* of a tubercular nature, after effusion has occurred, if the system be *rapidly* brought under the influence of mercury, such improvement follows as to lead one to believe that a partial absorption of fluid had resulted. In *simple meningitis* the writer has been fortunate enough to witness unmistakable results.

Calomel acts in 5 to 8 gr. doses as a powerful diuretic in cardiac dropsy. Leech saw 10 pints of urine passed in one day after its administration. Serious symptoms have, however, been noticed even after 3 grs. three times daily for two days.

In *typhoid fever*, large doses early in the disease are used by Continental physicians to curtail its course. The red iodide in minute doses was recently vaunted as a specific in *scarlatina*, *diphtheria*, and the perchloride in *cholera*.

Mercury in Syphilis—Mercury is a true vital antidote to the syphilitic poison, and Hutchinson believes that many cases of indurated *chancre* treated early by mercury never show any of

the characteristic symptoms of the secondary stage, and when these do appear they are milder than in cases where the mercury had not been used. (See the Author's Dictionary of Treatment, page 831—843.)

Mercury has, however, not only no action on the soft spreading sore, but its administration is injurious. In true indurated chancres, the mercurial should be commenced as soon as possible, and continued till thickening and induration melt away. Ptyalism and the other constitutional effects of the drug should never be produced, but small doses of the non-irritant preparations—calomel, as in Plummer's pill, or grey powder—should be steadily administered, and their use instantly suspended upon the appearance of changes in the gums, or an increase of saliva being observed. One grain of calomel, with quarter this quantity of opium; or one grain of blue pill or grey powder morning and night; or $\frac{1}{12}$ grain of corrosive sublimate twice a day; or 5 grs. Plummer's pill, three times daily, will be found enough. Milner contends that the green iodide is the best preparation, especially in light-haired and irregularly living patients.

It cannot be denied that excellent results follow the method of *inunction*, even when the ordinary administration by the mouth has failed. The results obtained at Aix amply prove this, and the writer has satisfied himself that doses can be tolerated there which would produce disastrous effects at home. Patients at a place like Aix, going for a specific purpose, will regulate their life as they will not at home, and, moreover, there is the powerful influence of climate, which probably aids elimination of the metal. The German ointment (1 part of Hg. in 3) is decidedly superior to our stronger B.P. preparation. 38 grs. may be rubbed in twice daily. The inunction method in selected tertiary cases, as in testicular enlargements, is the best treatment where the iodide of potassium fails, as it often will, in effecting a permanent cure.

The method of *fumigation* by a spirit lamp and calomel is troublesome and uncertain.

The *hypodermic* method is much used on the Continent— $\frac{1}{8}$ gr. of the bichloride in $\frac{1}{2}$ dr. water. 30 injections in as many weeks into the gluteal muscles are said to effect a cure. 1 grain of yellow oxide, or of calomel, suspended in vaseline oil or weak mucilage, may be similarly employed. Grey Oil contains 40 per cent. mercury. It is made by mixing 39 parts of mercury, 2 of mercurial ointment, and 59 of vaseline oil: of this 1 to 2 grs. may be injected daily.

Mercury is seldom given by the *rectum* or *endermically* unless for its local effects.

Mercurial treatment, as a rule, should be continued for at least one year, and it is a good general rule to prohibit marriage for four years. The administration should be discontinued, or the dose materially lessened, on the appearance of the physiological effects of the drug.

In *congenital syphilis* there is no preparation equal to grey powder, which may be given freely, as mercury in moderate doses seems incapable of doing harm whilst there is a large amount of the syphilitic poison for it to expend itself upon. Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterwards apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms come on markedly, then they bear very large doses again. A child half a year old may get $\frac{1}{2}$ grain of grey powder three times a day for three days, then $\frac{1}{2}$ grain every night, and this may be continued as long as the infant thrives. If no result seems to follow, a little of the ointment may be rubbed in occasionally.

The *corrosive sublimate* is the most poisonous of the mercurial compounds, causing violent purging, collapse, and death in a few hours when taken in large doses. It is the most powerful destroyer of germ life, and has been used with advantage internally and locally in a host of septic conditions. In *surgical* and *obstetric* practice, *diphtheria*, *gonorrhœa*, *tinea*, and numerous other ailments, its local application, with or without its internal administration as well, is beneficial. Considering the infinitesimal quantity of this substance necessary to form a solution which will *hinder* the growth of anthrax bacilli—viz., 1 in 1,000,000 (while 1 gr. in 5 gallons of water will *entirely prevent* the growth), it is easy to realise the enormous benefit which may be obtained from its disinfecting qualities without endangering the system by the action of the drug. The introduction of solutions of corrosive sublimate for washing out the vagina and uterus in lying-in hospitals has been followed by the lowering of the death rate; but its indiscriminate use has already led to many serious cases of poisoning. 1 in 5,000 is quite strong enough for ordinary solutions. It may be prescribed with iodides advantageously.

Rx. *Hydrarg. Perchloridi* gr. ij.
 Potassii Iodidi ℥ij.
 Aquæ Destillatæ ℥xij. *misce.*

Fiat mistura, st. ℥ss. ter in die post cibos.

Externally, *Ungt. Hydrarg.* is used to produce the constitutional effects of mercury upon the system, by being rubbed into

the skin. The following are a few of the uses of the different mercurial ointments which are applied for their local action:—

Ungt. Hyd. Subchlor. relieves the painful *itching* of various *eczematous* conditions about the genitals and anus; it is a valuable application to *all* indolent *syphilitic skin diseases*, and rarely causes salivation.

Ungt. Hyd. Ammon. acts as a poison to vermin, and readily destroys pediculi and their ova, and is used to kill the parasites which cause *tinea*, &c.

Ungt. Hyd. Co. and *Liniment. Hyd.* are used as substitutes for Scott's dressing. Spread upon lint, and applied with pressure around *diseased joints* and *glandular enlargements*, they are useful by stimulating the lymphatics.

Ungt. Hyd. Iod. Rub. is an active rubefacient, seldom used in this country except in veterinary practice, where under various names, "Newmarket Paste," "Stevens' Ointment," &c., it is successfully used to produce absorption of bony outgrowths and tumours. It is a powerful remedy for *goitre* in India, when aided by the rays of the sun.

Ungt. Hyd. Nitratis Dil. acts as a stimulant to the scaly stage of *eczema*, and in some way alters the action in the diseased skin, often after every other remedy fails. It is invaluable in inveterate *ozæna*, when diluted with glycerine and brushed inside the nose. The undiluted ointment has been successfully used to abort *whitlows* and *boils* by thickly spreading it over the inflamed part and covering with plaster.

Ungt. Hyd. Ox. Rub., diluted with eight times its weight of lard, or, preferably, an ointment of the yellow oxide (6 grs. to 1 oz.) is an invaluable stimulant and alterative in obstinate *conjunctivitis* and *eczema of the eyelids*, and is identical with "Golden Ointment."

The *Oleate of Mercury* is unstable and unsatisfactory.

Unguentum Metallorum is the name given to a mixture of equal parts of ointments of oxide of zinc, diluted nitrate of mercury, and acetate of lead.

Lotio Hyd. Nig. and *Flav.* are stimulating applications to various *chancroid* and other *sores* of a specific origin. Their efficacy leads one to suppose that they act by destroying the syphilitic poison as they come in contact with it.

Liq. Hyd. Nitratis is a powerful caustic, indicated in the treatment of *syphilitic warty growths* and *scrofula derma*.

A solution of the perchloride (5 grs. to 1 oz.) is used to destroy the *parasite of various skin diseases*.

Hydrastis Canadensis—The rhizome contains at least 2 alkaloids—hydrastine and berberine, and the hydrastin of commerce is a mixture of these. The rhizome has been found to act

as a tonic, and to control catarrhal conditions of the stomach, as in chronic alcoholism. According to innumerable observers it benefits the catarrhal conditions of all mucous membranes, as in *bronchitis*, *pharyngitis*, *otorrhœa*, *leucorrhœa*, *cystitis*, *gonorrhœa*, &c., a weak infusion of the drug acting still more potently when locally applied. It acts as a powerful agent in arresting hæmorrhages, especially *uterine hæmorrhage*, and many observers testify to its controlling *metrorrhagia* and *menorrhagia*, and even in reducing *fibroids*. It may be used wherever ergot is indicated; it does not cause painful uterine contractions, and it even has been advocated by Bartholow in constipation. One part of the fluid extract in 40 of water may be used in *gonorrhœa* and *hæmorrhoids*, or for the naso-pharynx.

Hyoscyami Folia—This drug affects the system like belladonna, producing delirium, dryness of the mouth, dilatation of the pupil, and sleep. It differs from it in being more decidedly hypnotic and less stimulating to the heart, and in its sedative influence over the urinary mucous membrane. Small doses are sedative and tonic to the heart; large doses excite, whilst excessive doses depress it; hence its usefulness in *cardiac asthma* and excitement of the heart from valvular lesions. In all the *spasmodic* affections in which belladonna is useful it may be employed. In inflamed and irritable conditions of the *bladder* it is valuable. The active principle of the drug is a mild *diuretic*, and in passing out of the system exerts its sedative influence upon the terminal nerves of the irritated membrane; and it is especially indicated when the bladder is contracting frequently, to expel small quantities of urine unnecessarily. It may be advantageously combined with alkaliës. It seems to increase the narcotic effects of opium, and hyoscyne promises well in acute mania. (See under Hyoscyne in the non-official remedies, where its relation to other alkaloids is stated.)

Children bear enormous doses of hyoscyamus, whilst the *aged* are seriously affected by even small quantities. It corrects the painful griping of purgatives, increases peristalsis, and relieves the pain of *internal neuralgic affections*. The juice in tea-spoonful doses is the best preparation.

R. *Tr. Hyoscyami* ℥vj.

Liquor. Potassæ ℥iv.

Ext. Pareiræ Liq. ℥ij.

Infus. Buchu ad ℥viiij. *misce.*

Fiat mist. st. coch. i. mag. quater in die ex paul. decoct. hordei.

Iodoformum, in long-continued doses, or where it has been slowly absorbed from wounded surfaces, produces disturbance of digestion, loss of appetite, malaise, vertigo, rapidity of pulse, increase of temperature, and cerebral disturbance, not unlike some forms of alcoholic intoxication, passing into melancholia, collapse, and possibly death. These symptoms may come on suddenly without warning if the salt has been applied to a large surface; the temperature may rise to 104° , delirium, mania, and coma may set in, and speedy death may ensue. Moorhof says symptoms of poisoning never occur if the drug be used alone and no other antiseptics be employed with it. Bicarbonate of potash acts as an antidote in poisoning by iodoform. Experiments prove that *in the laboratory* germs will live in a 50 per cent. solution, but it is equally certain that *even weak solutions coming in contact with pus at the temperature of the body* become powerful germ destroyers.

Iodoform is freely excreted by the pulmonary surface and kidneys, appearing as iodine in the urine, and though containing 90 per cent. of nascent iodine, it does not produce the irritant symptoms of even small doses of that drug. It is for its antiseptic properties that iodoform is used in surgery; dusted in fine powder over *sloughing sores, chancres, buboes, bed sores, and cancers*, it prevents decomposition and excites healing. The stench of cancerous discharges from the vagina and rectum is instantly removed by the use of a pledget of lint soaked in 1 dr. iodoform to 1 oz. glycerine. A solution of 1 in 12 of ether, or of 1 in 12 of flexible collodion, may be painted over *syphilitic sores*.

Iodoform is a powerful local *anæsthetic*, destroying sensation in the parts to which it is applied as carbolic acid does; the official suppository causes the sensation to be much blunted after its introduction into the rectum or vagina.

A bougie containing 10 per cent. of iodoform, with eucalyptus oil and cacao butter, has been used in *gonorrhœa*.

The B.P. ointment may be used for all ordinary sores, whilst 10 to 20 grs. to 1 oz. may be applied in *ophthalmia*; 1 to 4 may be used for *granular lids*. Its anodyne and antiseptic properties render it a remedy of great value for *burns*, where the gauze soaked in glycerine and water and covered with cotton wool and oiled silk can be used with benefit.

Iodoform ointment is used by Grigorieff for *scabies*.

It has been recommended as an inhalation in *phthisis*; but the internal administration in $\frac{1}{2}$ to 3 gr. pills in the writer's hands has given better results. It exerts its antiseptic and sedative properties upon the mucous membrane of the bronchi, during its excretion by this tract. In a similar way it may be expected to prove useful in *cystitis* and *urethritis*. Intrapulmon-

ary injections of iodoform, 1—2 grs. in ether, have been used with some success in *phthisis* and basilar cavity. Testa finding that the drug increased arterial tension and acted as a diuretic, has used it in *valvular disease*. It is of no value as an anthelmintic, or in *diabetes*. It has been given in *ulcer of the stomach* for its local action as a hæmostatic. Tonquin bean, musk, coffee, Peruvian balsam, and turpentine cover its nauseous odour.

Iodum externally is a valuable counter-irritant, weak solutions causing mild rubefaction, whilst the liniment will sometimes vesicate. Weak solutions (half the strength of the tincture) are absorbed when applied to the skin, and finding their way into the tissues stimulate the absorbent vessels, and thus aid the removal of *glandular swellings* and *local effusions*. Equal parts of the liniment and tincture is the best form for application to the chest or abdomen. The liniment applied in its strength, is found to cause changes of position in the corpuscular elements under the skin, but any effect produced by it is not owing to its absorption, but to its counter-irritant qualities. It has been found useful in chronic *glandular enlargements*, in various painful affections of the *thoracic* nerves and muscles, and painted in the neighbourhood of small *local inflammations* it often arrests the suppurative process and prevents the growth of *boils*. It is a powerful antiseptic, and the liniment will destroy parasitic skin diseases.

One part of the tincture in fifty of water is used to wash out *cysts* in which putrefactive changes are going on; and diluted with an equal bulk of water, or alone, the tincture is injected into the serous cavity surrounding the testicle to excite adhesive inflammation and work a radical cure in *hydrocele*.

The vapour of iodine is used for inhalation in chronic suppurative *bronchial* affections. By incorporating iodine with the constituents of an ordinary candle a most valuable method of obtaining its virtues is obtained; such "Iodine Candles," when burned, give out the vapour of the drug. The tincture (15 minims) injected into *solid bronchocèles* and enlarged *lymphatics*, causes their absorption.

Iodine is a powerful irritant poison, producing violent vomiting, purging, giddiness, convulsions, syncope, and death.

Internally, iodine in the free state is not often used, since iodide of potassium possesses nearly all the properties of the metalloid, without the disadvantage of causing gastric irritation. It is inferior to iodine in the treatment of *scrofula*, and iodine produces results in *malaria* where iodide of potassium is inert. Granville uses it in *gout*.

Since *Iodide of Potassium* is the form in which iodine is generally prescribed internally, its use will here be referred to. Given to a healthy man, iodide of potassium, in small doses ($\frac{1}{2}$ gr.),

improves the appetite and increases the weight of the body. It is rapidly absorbed, and probably remains as iodide of sodium in the blood; and if the dose is increased and taken frequently, a characteristic group of symptoms is developed, to which the name of *iodism* is given. A brassy taste is felt in the mouth, the amount of saliva is increased, and there soon appear signs of irritation of the mucous membranes of the eye, nose, throat, and bronchial passages, resembling an ordinary catarrh, with swelling of the eyelids; the brows and teeth ache; eruptions like acne, purpura or urticaria appear; appetite fails; nausea and diarrhoea come on; waste increases, causing emaciation, debility, and a sinking feeling at the bottom of the sternum; sexual power is destroyed, and the urine becomes increased in amount, and tuberculosis may supervene. All the glandular organs of the body are stimulated to increased activity, and the drug has been said to cause wasting of the mamma and testicle. In some, the symptoms of iodism cannot be produced, as patients have been known to take 1 to 2 drs. daily for several months or years. It is eliminated by the kidneys, salivary glands, bronchial membrane, and mammary glands; and Binz believes that whilst being eliminated, and also whilst being carried to the different tissues of the body, *free* iodine is given off, which produces all the effects of the drug. In this way the irritation of the eye, nose, and bronchial membranes is produced, and the eruptions are probably produced by the elimination of the free iodine by the glands of the skin.

It should be remembered that some patients cannot take even the smallest doses of this drug without suffering from alarming iodism. The writer has many times witnessed the remarkable phenomenon pointed out by Brunton, that patients who took 1 or 2 grs. with great inconvenience ceased suddenly to have any trouble as soon as the dose was increased to 4, 6, or 8 grs.

It is invaluable in many *scrofulous* states, causing the absorption of various *effused unhealthy products*, either by increasing the activity of the absorbents or by rendering such products more fluid. In this latter way it acts upon the secretion of *chronic bronchitis*, and thus becomes one of our best expectorants. The products of *pleuritis*, *pneumonia*, and *pericarditis* often yield to moderate doses (5 grs.), and it is the best remedy for the early stages of *cirrhosis of the liver and lungs*. Schmidt has used it with success internally, along with the local application of cold to *goitres*. It is a strong anaphrodisiac and antigalactagogue, diminishing the secretion of milk satisfactorily in 10 gr. doses. Upon its elimination by the kidneys it acts as a powerful diuretic.

Villemin states that full doses will cure *erythema* in the first few days, and it is given with success in *psoriasis*.

In *chronic rheumatism*, *gonorrhæal rheumatism*, and *rheumatoid arthritis* it gives good results.

In large doses (20 grs. and upwards) iodide of potassium has been used for the treatment of *internal aneurisms* beyond the reach of surgery. It probably acts upon the coats of the diseased bloodvessel, and may effect alterations in the physical qualities of the blood; it also leads to fibrinous deposition and solidification. It may give marked relief to the wearying pains caused by aneurisymal growths without exercising any cure, and it gives good results in *angina*.

Germain Sée and Laborde maintain that it acts like digitalis as a true cardiac tonic, and the writer has obtained splendid results with it in *valvular diseases*.

It has been used with apparent success in the treatment of *enteric fever* on the Continent.

In *chronic metallic poisoning*, the iodide of potassium, entering the blood, meets with the albuminates of mercury or lead stored in the tissues, and by forming soluble salts, which are eliminated, the system is purged of the poisons.

In a somewhat similar way iodide of potassium combines with the specific poison in *tertiary syphilis* and decomposes it. Its power over *nerve lesions*, the result of syphilitic deposit, is rapid, certain, and often lasting; *gummata* melt before its influence; and *bony enlargements* of a specific origin are often speedily reduced; but it must in such cases be pushed boldly in doses of 20 to 40 grs. Some physicians push the drug in such cases to the extent of 1 oz. in 24 hours, and Seguin states he has given 2 drs. thrice daily to patients between 4 and 8 years old without any bad results; this line of treatment he speaks of as the "American." The physician will seldom meet with cases where such doses are necessary. Many observers maintain that the effects of the drug in *syphilis*, though marked, are not lasting or curative.

The same result is occasionally noticed as was mentioned about mercury in congenital syphilis—*i.e.*, after the apparent destruction of the specific poison, the system is less tolerant of the drug. It appears to possess little influence over the earlier stages of syphilis. The pains of *rheumatoid arthritis* are often benefited by the judicious administration of the iodide, and it speedily relieves *bronchial asthma* depending upon simple catarrh. It is perhaps the best remedy in asthma when pushed. It acts occasionally as a powerful but uncertain diuretic.

The treatment of *hydrocephalus* by iodide of potassium has many advocates, and though it appears to have some control over the amount of fluid poured out, still evidence is not forthcoming to prove that it has any curative influence.

Half a grain, with 10 minims of hippo wine, is a valuable tonic given after food. Ammonia increases the effect of iodide of potassium, and when the dose exceeds a few grains it never should be given to a fasting patient.

On page 51 will be found the description of a method by which 6 grs. of the iodide can be ordered in a pill.

The following is still a favourite form with many :—

R. *Linimenti Iodi* ℥j.

Liquoris Potassæ q.s.

Ad saturat. ferme, st. min. xx. ex cyath. aquæ ter in die post cibos.

Iodine is bleached by Carbolic Acid, and Percy Boulton recommends the following colourless antiseptic for general purposes :—Liquor iodi 2 drs., carbolic acid 50 grs., hot water 20 oz. Dr. J. Wilson finds that 40 minims of the liniment of iodine, 8 minims of carbolic acid, and 32 minims of liquor potassæ, make a colourless liquid (containing 1 of iodine in 18) which is neither caustic, vesicant, nor irritant. For colourless Tincture of Iodine see the B. P. C. formula at the end of this volume.

Ipecacuanha was formerly employed as a counter-irritant, owing to its power of producing a pustular eruption. The active principle (*emetine*) is a powerful poison. Large doses of the powdered root cause vomiting—*directly*, by acting upon the peripheral extremities of the pneumogastric in the stomach; and *indirectly*, by stimulating the vomiting centre; this effect is produced either by the hypodermic injection of the alkaloid, or by its internal administration. Its emetic action is too slow to be of use in poisoning, but it is highly beneficial in *croup* and *bronchitis* in children. In smaller doses ($\frac{1}{2}$ gr.) ipecacuanha acts as a direct stomachic, increasing the vascularity of the stomach, and promoting the flow of gastric juice, and, combined with the same quantity of iodide of potassium, we have one of the best remedies for *atonic dyspepsia*. Still smaller doses (1 min. of the wine), Ringer affirms, will cure the *vomiting* of various conditions, as *pregnancy*, *alcoholism*, *migraine*, &c. In larger doses (3 to 5 grs.), the powder acts as a diaphoretic, but is uncertain unless when combined with opium—as in Dover's powder—and it is remarkable that the combination is so efficacious, only a grain of either remedy being in each dose, whilst, much larger quantities of each, separately, are so uncertain. In diaphoretic doses, it also acts very markedly upon the *bronchial* mucous membrane, causing free secretion of thin mucus; hence, in disease it is one of the best expectorants we

possess. The tough secretion of *chronic bronchitis* is thus rendered more fluid, and comes up with greater ease to the patient; whilst in acute attacks the dry inflamed membrane is soon covered over with a moist secretion.

Rosbach demonstrated the expectorant powers of emetine upon the exposed tracheal membrane, and his results prove it to be almost as valuable as apomorphine in *bronchial catarrhs* and *laryngitis*. It is especially indicated in inflammatory affections of the bronchial membrane in children, assisting the expulsive action and diminishing the adhesiveness of the secretion; its *diaphoretic* effect in these cases being also beneficial.

In *winter-cough* there is no remedy more efficacious than ipecacuanha, and a spray of equal parts of the wine and water has been successful in Ringer's hands.

The writer, in conjunction with Dr. Workman, made a series of experiments on the action of various remedies upon the cilia of the bronchial mucous membrane. Though a weak solution of ipecacuanha succeeded oftener and more effectually than any other remedy in restoring the movements after their cessation, the results were far from satisfactory or conclusive.

In speaking of ciliary excitants on page 344, the probability of medicinal substances assisting expectoration by their influence upon the cilia was referred to.

Ipecacuanha has been given in nauseating doses in various *hæmorrhages* with uncertain results. On the liver this remedy acts as a powerful stimulant, and it slightly increases the intestinal secretion.

In *dysentery*, in the acute stage, it possesses powers which are deemed almost specific; it should be given in doses of at least 20 to 60 grs., and the stomach seldom rejects it, if absolute rest be enjoined and liquids sparingly swallowed. In *acute pneumonia* doses equally large have been given with good results. It has some influence over *whooping-cough*; as an emetic, the wine may be given in tea-spoonful doses every 15 minutes to a child 1 year old, or 5 minims may be administered every hour in bronchitis.

(Fothergill's Dinner Pill.)

Rx. *Pulv. Ipecacuanhæ* gr. j.
 Acid. Arsenios. gr. $\frac{1}{20}$.
 Pil. Aloes et Myrrhæ gr. iiss.
 Pulv. Pip. Nig. gr. ij. *misce.*

Fiat Pil. "The same dose of strychnine may be substituted for the arsenic." Above is an excellent fillip to the digestion.

Jaborandi and Pilocarpine act as powerful Sialagogues and Diaphoretics. After the hypodermic injection of $\frac{1}{3}$ gr. of the nitrate of the alkaloid marked results follow in a few minutes. There is flushing of the face and neck, beads of perspiration appear on the skin of these parts and rapidly extend over the body, and soon the entire cutaneous surface becomes bathed in profuse perspiration, which may pour in streams for some hours from the patient, saturating his garments or soaking the bed clothes. Saliva at the same time commences to flow, and it becomes also very profuse. Other secretions are augmented—the tears, bronchial and nasal mucus, gastric and intestinal juices, the cerumen from the ears, the urine, and if a female, the milk, and uterine and vaginal mucus are increased. The blood vessels dilate as seen by the throbbing carotids, the pulse quickens and the patient seems warm; soon, however, with the full establishment of the perspiration he feels cold and shivers, the pulse slows a little, while the blood pressure rises and finally falls. The pupils contract and the accommodation becomes tense; vomiting and painful forced micturition occur. As the effects pass off the pupils may dilate, and the patient feels sleepy and exhausted, and if put in the balance may sometimes be found to have lost half a stone in weight. The salivation and perspiration are the result of a stimulant action on the peripheral terminations of the nerves of the salivary and sweat glands, as well as some irritation of the *centres* which preside over these organs; the other secreting organs are probably affected in the same duplex manner. The contraction of the pupil is caused by the irritation of the peripheries of the third nerve, and follows also its local application. The spleen, uterus, bladder, and intestinal muscular fibres contract, and in large doses the heart fails through paralysis of the endings of the vagus, which were at first stimulated, the ganglia escaping. The bile is not increased; the drug is eliminated by the kidneys, but not by the skin. The respiration is scarcely affected. The writer has sometimes seen collapse and alarming prostration speedily follow the hypodermic injection of even $\frac{1}{4}$ grain.

Nearly all the effects of pilocarpine are antagonised by atropine, and it fails to produce salivation and sweating if this latter drug has been previously administered. Atropine should be promptly injected if alarming symptoms show themselves during the use of jaborandi or its alkaloid.

Pilocarpine has been applied locally to the eye in *glaucoma*, *intra-ocular hæmorrhage*, *iritis*, and *retinitis*, and good results appear to have followed its hypodermic administration in *detachment of the retina*. In *uræmic coma* and *convulsions* the hypodermic use of $\frac{1}{4}$ gr. will sometimes save life by the rapid elimination of urea

and other products, by the perspiration. In Bright's disease the hypodermic injection of the alkaloid, or 5 grs. of the extract, or 1 oz. of the infusion given by the mouth give good results by diminishing blood and albumen and increasing the amount of the urea. In the same way it diminishes *anasarca*, and by stimulating the kidneys assists in the removal of *pleural* and *peritoneal* accumulations. In *bronchial* affections it produces most marked effects, even blocking up the tubes by the profuse secretion which it creates, but it does not achieve anything which apomorphine and emetine will not perform without the serious drawback of its action upon the skin and saliva (see page 349). Nevertheless it has been used in *asthma*, *pertussis*, *bronchitis*, *tonsillitis*, *laryngitis* and *diphtheria*; in *diabetes*, *amenorrhœa*, *uterine* affections, *syphilis*, in poisoning by *atropine*, and in chronic poisoning by *iodine*, *arsenic*, *lead*, and *mercury*; and in skin diseases, as *prurigo* and *urticaria*. Under its use the hair has been noticed to grow rapidly, and it has been given to cure *baldness* with some success; it may be applied externally to the scalp. Hypodermic injection will relieve ordinary *toothache*, and recently, enlarged glands have been reduced by injecting the drug into their centres.

Small doses ($\frac{1}{25}$ gr.) are beneficial in the sweating of *phthisis*, and large doses ($\frac{1}{2}$ gr.) cause contraction of the *uterus*, and may induce labour. *Hydrophobia* and *myxedema* have been successfully treated in a few isolated cases by its use. Josham has found that $\frac{1}{3}$ gr. hypodermically has most remarkable sobering powers in *drunkenness*, and a similar daily dose has been given to increase the secretion of the mammary glands.

Jalapa is a powerful hydragogue cathartic, acting, like scammony, entirely by its *local* irritating effects upon the intestine, as injection of its active principle into the circulation has no effect upon the bowel. It must come in contact with the bile to be efficacious; the extract and resin produce considerable pain and griping; the compound powder will be found the most satisfactory form for giving the drug, and it is especially in *anasarca* and *ascites* that it is indicated. It may be given in 1 dr. doses, stirred up in a tumbler of water, or swallowed dry in wafer-paper. The resin possesses the great advantages over the root of being less bulky and less nauseous, and may be given in 4 gr. doses, in pill.

Juniperi Oleum—A mild stimulant and stomachic in small doses. It rapidly enters the blood, and is picked out by the kidneys, which it powerfully stimulates, carrying with it increased quantities of water if *dropsy* exist, whilst in health it may even diminish the quantity of water. It excites the *genital organs*, and seems to resemble cantharides when given in very large

doses, as strangury and priapism have been known to follow its use. The spirit makes a good addition to diuretic mixtures, and may be used as a substitute for gin.

Kamala is a cathartic, 2 drs. speedily producing copious evacuations; it is, however, only used for its destructive action upon the *tape* worm, killing it, and afterwards causing its expulsion. It will in a like way destroy *lumbricoids*. 1 to 2 drs. should be taken suspended in mucilage or gruel, and, if necessary, a purgative should follow.

Kino is a powerful astringent, containing nearly $\frac{3}{4}$ of its weight of tannin; it acts like it, and is useful in *diarrhæas*, *hemorrhages*, *relaxed throat*, or when the effect of tannin is desirable. The compound powder is an excellent preparation, combining with the astringency of kino the narcotic effects of opium. It resembles in its action both catechu and krameria.

Kousso—(See Cusso.)

Krameria—Rhatany is a valuable astringent and tonic, resembling kino and tannin in its action. 5 grs. of the extract and $\frac{1}{4}$ gr. morphine made into a suppository are valuable in *fissure* and *prolapse of the anus*; and a tea-spoonful of the tincture in a wine-glassful of water makes a valuable wash for *spongy gums*, *relaxed throat*, or *mercurial stomatitis*; or the following may be used:—

R. *Tinct. Kramericæ*
 Tinct. Myrrhæ
 Tinct. Cinchonæ
 Tinct. Kino ana $\overline{\text{ʒj.}}$ *misce.*

Fiat mist. ʒj. ex ʒi. aquæ utend. pro lot. oris mane octeque.

Lac—Milk is introduced into the Pharmacopœia for making cammony mixture, and in addition to its nutritive qualities is especially indicated as a diet where it is desirable to diminish as much as possible the bulk of the fæces. Externally it is emollient, and may be used with much advantage as a soothing injection in inflamed conditions of the vagina and lower portion of the neck of the uterus. It is a good vehicle in which to administer camphor and quinine.

It should be used to wash out the stomach in poisoning with corrosive sublimate or sulphate of copper.

Lactuca—Lettuce has been introduced as a substitute for opium. It does produce feeble narcotic results, but its effects

are so uncertain that it could be well dismissed from the B.P. Its active principle—lactucarium—is a feeble diuretic, and may be taken in 10 gr. doses.

Laricis Cortex—Larch bark is an astringent containing tannin, and possesses some power in diminishing the profuse secretion of *chronic bronchitis*. On being eliminated by the bronchial mucous surface it is, like turpentine, very useful in *hæmorrhage* from this membrane. It is beneficial in the *hæmorrhage of purpura*.

Laurocerasi Folia, though often used as a mere flavouring ingredient, contain hydrocyanic acid, and possess, when taken in sufficient doses, all the powerful sedative properties of that drug. (See Acid. Hydrocyanic.)

Lavandulæ Oleum acts as an antispasmodic, like the following; it is seldom used except as a perfume, and the tincture is prized as a colouring ingredient, and enters into Fowler's solution, which undoubtedly would be better without it. Five minims of the oil on sugar will rapidly relieve *colic*, and it can be given in combination with cajuput.

Limonum—The oil and rind of the lemon are used in medicine only on account of their flavour, though in 5 to 10 minim doses the oil is a valuable remedy in painful and *irregular contractions of the intestinal tube* caused by accumulations of gas produced by fermenting food.

A decoction prepared by boiling fresh unpeeled lemons, sliced, is regarded as a valuable antiperiodic in *malaria*. The *fresh* juice has been found to promptly check *epistaxis* when injected into the nostril. (See under Acid. Citric., where the action of the Succus is described.)

Linum—Flaxseed contains a mucilaginous principle, which it yields to boiling water, and which acts as a soothing demulcent when it comes in contact with the gastro-intestinal mucous membrane, protecting it from irritating secretions. It has reputed expectorant qualities, which probably entirely depend upon its action on the throat as it passes through on its way to reach the stomach. Large doses of the infusion act as a diuretic by mildly stimulating the kidneys, and a patient with an *irritable bladder* often finds relief from it. The poultice affords the best medium for applying a continuous moist warmth to *local inflammations*; it relieves tension and promotes resolution, whilst, if matter has already formed, it will meet with less difficulty in working its way to the surface through the softened tissues. The oil is laxative, but is seldom given except as an enema. Externally, it is a favourite application to burns, when made into an emulsion with lime water, constituting "Carron Oil."

Lithium—The carbonate and citrate of this element act like the corresponding salts of potassium, over which they possess the great advantage of being less caustic and of forming much *more soluble salts with uric acid*. The urate of sodium, which exists so largely in the system in *gout* is converted into the more soluble urate of lithium, which acts as a diuretic as it is eliminated by the kidneys. This result follows the use of either the carbonate or citrate, the latter being changed into the former in the system ; and a solution of the carbonate ($1\frac{1}{2}$ dr. to 1 pint) has been found useful by Garrod for removing the *chalky deposits of gout*. The prolonged administration of lithium salts will dissolve uric acid calculi in this way ; hence they are called lithontriptics.

Nikanoroff has demonstrated that these salts differ extremely from potassium salts in having no depressing effect on the heart, and they closely resemble sodium salts in depriving the red corpuscles of their hæmoglobin. When introduced into the stomach he found them eliminated by the urine within three days without increasing the amount of uric acid.

The effervescing liquor is an agreeable form for administering the drug. 15 grs. may be taken daily in this way.

Lobelia in large doses excites vomiting and purging, depresses, and finally paralyzes the respiratory centre and peripheral endings of the vagus in the heart, and causes intense prostration and complete muscular relaxation, acting like tobacco, as a powerful narcotico-acrid poison, and causing death through its action upon the respiration. It possesses two very decided actions—it is a powerful Antispasmodic and Expectorant. It has been given in *bronchitis* and *asthma* ; in the former disease, however, it is often uncertain and disappointing, unless pressed to the verge of producing its physiological effects ; in the latter it occasionally affords marked relief. It also affords relief in some cases of *cardiac dyspnoea* and *pulmonary congestion*.

Ringer recommends drachm doses of the tincture every hour ; but very often serious depression and sickness follow these doses, and it may be said that lobelia only produces its beneficial antispasmodic effects when a dose bordering on danger has been administered. Smaller doses sometimes relieve *spasm* of the *bowel* caused by fæcal accumulations. It has been used in *whooping-cough*. It increases the action of the skin and kidneys, acting as a diaphoretic and diuretic.

There is no reason why the antispasmodic effects of lobelia may not be intensified by narcotics, and the combination with opium, morphine, or preferably chlorodyne, will give satisfactory results. It can be given with advantage in *catarrhal asthma* along with pomorphine ; or with iodides.

The alkaloid—lobeline— $\frac{1}{50}$ gr. is given in *asthma* and *angina*.

R. *Tr. Lobeliæ Ether.* ℥vj.
 Spt. Ammon. Aromat. ℥iv.
 Tr. Chlorof. et Morphinæ ℥ii.
 Syrupi Simpl. ad ℥ij. *misce.*

Fiat mist. cpt. coch. i. min. tertiis horis p.p.a. ex aqua.

Lupulus—Hop is a valuable stomachic, increasing the vascularity of the gastric membrane, aiding digestion and promoting appetite; by its slight narcotic effects, it promotes sleep in various *irritable* or *delirious conditions*, either when taken by the mouth or made into a pillow, to rest the head upon. It is largely owing to the hop contained in them that malt liquors possess tonic properties. A bag filled with hops, dipped in very hot water, makes an agreeable fomentation in *colic, internal pain, or local inflammation*. Lupuline, in 5 gr. doses, is the best form for administration.

Magnesia and its carbonates act in the same way; entering the stomach, they are partly dissolved by the gastric juice and absorbed; the residue passing down the bowel is converted probably into bicarbonate of magnesium, and, acting like the sulphate, though much more mildly, it purges or acts as a laxative. The antacid properties of magnesia are serviceable in *acid dyspepsia* and *heartburn*, whilst tastelessness and freedom from acrid qualities and danger, in large doses, make it a favourite *purgative for children*. Gregory's powder is a valuable antacid laxative tonic. Magnesia can be given in 2 dr. doses in milk or lemonade. This latter increases its purgative qualities. The carbonate, by giving off carbonic acid in the stomach, has local sedative qualities not possessed by magnesia. The *Liquor Mag. Carb.* is an agreeable and mild purgative, less liable to lead to the formation of concretions of magnesia in the colon, than the lighter powders. It affords the best treatment for acute and chronic *urticaria* in the adult, and for the various forms of *nettle-rash* in infancy and childhood. It may be combined in these cases with tincture of rhubarb.

(Dr. Gregory's Colic Mixture.)

R. *Magnesii Carbonatis* ℥i.
 Tincturæ Card. Co. ℥ij.
 Aquæ Anethi ℥ss.
 Syrupi ℥ij. *misce.*

Fiat mistura, sumat cochleare i. min. frequenter in die.

Magnesii Sulphas is the most certain and safe of saline purgatives. Professor Hay in his famous experiments upon the action of saline cathartics, which have thrown a flood of light upon this portion of the field of both Physiology and Pharmacology, has demonstrated the action of this salt. He found that it produced copious intestinal secretion according to the amount of the dose and the strength of the solution. The low diffusibility of the salt prevented the absorption of the secreted fluid, and thus between retarded absorption and stimulated secretion a large amount of serous fluid accumulated in the bowel until the quantity of liquid amounted to about what would be necessary to form a 5 or 6 per cent. solution of the salt. The peristaltic action of the bowel was but slightly increased, and this increase was owing to the distension caused by the large collection of secreted fluid. The sulphate was split up, and the acid, being more easily absorbed than the base, disappeared partially from the small intestine, to return, however, shortly afterwards. Meanwhile, the base (magnesia) was gradually undergoing absorption, but never pursued the same peculiar course of absorption and excretion as did the acid. In this way he explains the remarkable fact, that one-fourth of a purgative dose, if injected into the veins, will cause death, but when swallowed the salt is split up in the canal, the toxic or basic part entering the blood so gradually that it has time to be excreted by the kidneys. These important results were obtained with phosphate and sulphate of sodium and sulphate of magnesium. It was that portion of the salt which remained within the tube that caused the secretion of intestinal fluid, and not the portion absorbed into the blood. When the salt was injected into the blood directly, purgation did not follow, but rapid poisoning by profound depression of both heart and respiration soon supervened. The fluid accumulated in the intestine after the administration of sulphates of magnesium, and sodium at the expense of the fluid part of the blood, which afterwards recouped itself from the fluid of the various tissues. The weaker the solution of the salt administered, the less fluid was extracted; and if less than 5 per cent. solution were swallowed, no increase in the intestinal secretion from the blood occurred. If, however, a *very* concentrated solution were given, and the canal were quite empty, and no water were swallowed before or after the dose, a profuse pouring out of intestinal secretion, and subsequent concentration of the blood, soon followed; thus after fasting, a large dose (say 1 to 2 oz. sulphate of magnesium dissolved in its own weight of water) will cause almost as free depletion as if the lancet were used.

Prof. Hay obtained good results when used in this way in dropsies and for the removal of large serous accumulations. The

rapid withdrawal of so much serous fluid from the blood is speedily followed by the extraction of large quantities of the transuded fluid from the areolar tissue or peritoneal cavity.

Friedrichshall water contains sulphate of magnesia, and increases both the secretion and the peristaltic action, and produces a result in *chronic constipation* not unlike cascara in some respects. In *congestion of the portal system*, the sulphate of magnesium or Friedrichshall water is the speediest and safest cathartic.

The carbonate may be well combined with the sulphate, and if administered in peppermint water, constituting the hospital Mist. Alb., makes a palatable and efficacious purgative, suitable in many diseased conditions. The new B.P. Mag. Sulph. Efferves. is a very good preparation.

Manganese Salts act somewhat after the manner of iron. They are used in *amenorrhœa*, *gastrodynia*, and *anæmia* by some. The black oxide is merely introduced into the B.P. for making chlorine. When injected into the circulation Kober found that the paralysis of reflex action which resulted was produced by the destruction of the transverse conducting power of the cord. Death resulted from cardiac depression. For the action of Permanganate of Potassium see under Potassium.

Manna acts as a mild purgative or laxative, and was formerly much used for children. It causes flatulent distention and griping from its irritation of the bowel. It may be given in infusion of senna.

Marmor Album is used for making carbonic acid gas.

Mastiche possesses in a feeble degree the stimulating properties of the turpentine. It is eliminated by the kidneys and bronchi, and is used to lessen the profuse discharge in *chronic bronchitis*. It has been long used in the East as a masticatory to perfume the breath, and it is still used as a tooth stopping preparation.

Maticæ Folia possess aromatic and tonic properties of a low order. The drug is seldom prescribed internally, except with the idea of its acting like cubebs upon the inflamed *urethral surface*. It is used as a local application to *bleeding points*, and the leaf was supposed to act in this way on account of its reticulated structure; but the impalpable powder acts as a local astringent, and is valuable in treating *leech bites* and small *bleeding wounds*. Its astringency, however, is not owing to the traces of tannin which it contains, but probably to its volatile oil.

Mel Depuratum is seldom used in medicine, except as a vehicle for more active remedies. In large doses it acts as a mild laxative. It has been praised for its expectorant qualities.

which, if they exist, are probably owing to its local effect upon the throat and fauces. Externally, honey has been used as a protective application to *boils* and *excoriations*. Its efficacy in *aphthous* states of the mouth entirely depends upon the borax with which it is associated. It has antiseptic properties like sugar. Oxymel is used as a *cough syrup*, and probably its action is purely local.

Menthæ Piperitæ Oleum and Menthæ Viridis Oleum are rapidly absorbed into the system, and behave as mild diffusible stimulants. Coming into contact with the gastric mucous membrane, they exercise at first a stimulating and afterwards a local sedative or *anæsthetic* effect, dispelling *nausea* and correcting *uneasiness*. They correct the irregular painful sensations caused by accumulations of *flatus*, giving speedy relief, probably through a reflex act by driving on the imprisoned gas. In a somewhat similar way the *gripping* of *cathartics* is obviated. 5 minims of the oil may be given in a little hot water and sugar, and repeated every hour. Externally, when applied undiluted, these oils produce *anæsthesia* and *relieve the pain of superficial neuralgias*, and *herpes zoster*, and possess powerful antiseptic properties which have been useful in *diphtheria* and *phthisis*.

Menthol is a powerful Antiseptic and local Anæsthetic. When applied to the skin it destroys sensation, producing numbness without corrosive action, and thus it relieves when painted over the course of painful nerves, as in *neuralgia*, *sciatica*, and *pleurodynia*. It relieves *toothache* when applied to the carious cavity, and is a parasiticide when applied to various skin diseases. A 20 per cent. solution in olive oil has been applied with a syringe in *laryngeal* and *tracheal tubercle* with good results, its anæsthetic effects being cumulative, so that Rosenberg finds, after a few injections, that the anæsthesia lasts 24 hours. It is also a good expectorant.

Mezerei Cortex—Used now only as an irritant; when applied externally it causes inflammation of the skin and raises the cuticle like cantharides, though uncertain and slow in its action. It has diuretic properties, and was at one time supposed to act as an antidote to the poisons of *syphilis* and *rheumatism*, and to be useful in *inveterate skin diseases*.

Mica Panis is employed as a soothing application in the form of a poultice to local inflammations, as it absorbs and retains a considerable quantity of hot water. Bread-crumbs are also a very good excipient for pill masses, giving both firmness and toughness to brittle pills; when used to make nitrate of silver into pills its chloride of sodium should be removed by washing.

Mori Succus—Mulberry juice is a mild laxative in large doses. It contains tartaric acid, and, like it, acts as a refrigerant in *febrile conditions*, probably allaying thirst by its local action on the parched throat and fauces. The syrup is used to impart its beautiful lake colour to mixtures.

Morphine. (See under Opium.)

Morrhua Oleum is the most easily-digested of all fats, and possesses very high nutritive qualities. Its great efficiency as a restorative agent in *wasting diseases* depends to some extent upon its power of aiding the assimilation of other foods, which would not be absorbed except in its presence. After meeting with the pancreatic juice and bile, it readily emulsifies and enters the lacteal vessels, and it appears to have the power of bringing along with it the oily and nitrogenous elements of the food. Digestion is thus considerably facilitated, the blood corpuscles are augmented, the weight of the body is increased, and a stimulus is given to healthy cell formation, which to some extent depends upon fat supply. It is a valuable expectorant, and Brunton believes, in *bronchitis*, that it acts by nourishing the newly formed cells, which otherwise could not take on the character of mucous cells.

The great utility of cod-liver oil in *wasting diseases* is beyond dispute, and often its effects are decidedly curative in some forms of *chronic phthisis*, and in conditions like *scrofula*, *syphilis* and *rickets*, depending upon defective nutrition or errors of assimilation.

By directly supplying fat, which is an important element in the composition of the nervous system, cod-liver oil is beneficial in *nervous exhaustion* and *neuralgia*, and hastens repair in various structural and functional affections of the *nerve centres*. In a similar way, by supplying fat where there is much muscular wear and tear, the body weight is kept up; since fats are directly and easily converted into muscular force, and prolonged exertion can be maintained on oils alone.

The chemical constituents found in cod-liver oil have been constantly regarded as affording a satisfactory explanation of its effects in directly increasing the weight of the body and combating disease; but the small amount of iodine is too insignificant to account for its action, and, moreover, iodine does not produce the beneficial results of the oil when given alone. The biliary matter contained in cod-liver oil undoubtedly assists the absorption of the oil and hastens its passage through animal membranes.

The writer found, as a result of carefully weighing the subjects of disease under a course of cod-liver oil, that they *increased considerably more than the weight of the oil taken by them*. It is probable that the oil, by its biliary constituents, causes the

absorption and assimilation of food elements not usually finding their way into the lacteals, and nourishes the body independent of its own highly nutritious qualities. The many diseases for which this remedy appears to act as a specific depend upon some deep-seated error in assimilation, which is removed by the continued use of this valuable food and medicine. Hence the slowness of its action in cases of *chronic rheumatic arthritis, lupus, psoriasis, &c.*

Cod-liver oil should not be given in febrile conditions, nor in irritable nor catarrhal affections of the stomach and intestines. *Phthisis*, accompanied by high temperature, is not benefited by it, but a slight degree of fever should not prevent its administration if the digestive organs are healthy ; and if in such cases an effervescing mixture of the bicarbonate of potassium with lemon juice be given with a minute quantity of morphine for three or four days *the oil will be often relished afterwards.*

No advantages follow the mode of giving cod-liver oil in large doses except that the surplus quantity generally acts as a mild purgative, but it often upsets the stomach and causes slight congestion of the liver. Tea-spoonful doses will be found enough to begin with in all cases, and it is a good rule to confine its administration to bed-hour for the first few days. It should always be given *soon after a meal.*

Various plans are suggested to cover its taste, but it is probable that the efficacy of the oil is diminished by the saponification and chemical changes which it undergoes in producing many of the so-called emulsions. The combination with extract of malt is a valuable one.

It can be emulsified by gum acacia or tragacanth, and flavoured with cinnamon, lemon, or bitter almond. This latter is the best, but, as a rule, it is advisable to begin with the oil in small doses, and leave the vehicle to the taste or caprice of the patient, who may try water, milk, coffee, wine, orange juice, beer, punch, &c., according to fancy. Some patients can swallow the oil without any trouble, but the unpleasant eructations afterwards cause intense discomfort. In these cases the addition of any flavouring ingredient is a mistake, and the only preventive (if the patient can tolerate it) is to hold the oil in the mouth for a time, and cause it to be thoroughly mixed with saliva by moving the tongue round the inside of the cheeks. Where this can be tried, the oil will be found to rapidly digest.

When no method can be found by which the oil is retained in the stomach, then recourse must be had to inunction ; two to four drs. should be rubbed into the skin after a hot bath, and there can be no doubt that good often follows this practice. *The process of inunction is of the greatest use in the wasting diseases of*

children. After about one table-spoonful is well rubbed into the skin of the abdomen, a deep flannel binder should be put on. This in a few days becomes saturated with the oil, and should be covered with as much thin mackintosh as will surround the body. The inunction should be repeated twice a day, and the flannel should be changed not oftener than once a fortnight.

The writer is satisfied that by the persistent and intelligent application of the oil in this manner surprising results may be obtained. Hypodermic injection of the oil is recommended.

Moschus is a diffusible stimulant and antispasmodic. It has enjoyed some reputation in low *febrile* and *typhoid states* with great nervous *excitement* followed by *prostration* and collapse. It acts as a stimulant to the respiratory centre. It has also been used in various disorders supposed to be of spasmodic origin. The dose (10 to 20 grs.) costs so much that the use of the drug is now practically confined to cases of such gravity that there is little opportunity given to test its questionable properties. Barlow advises it in the *respiratory convulsions* of infancy, $\frac{1}{2}$ gr. for a child one year old.

Myristica—Nutmeg is a well-known aromatic stomachic remedy, used for its agreeable flavour. In small doses (10 grs.) it acts as a stimulant to the stomach by increasing the flow of the gastric juice, aiding digestion and promoting the desire for food. In the same way it acts further down the canal by dispelling accumulations of gas and relieving *colic* and *spasm*. In large doses it is a *powerful and even dangerous narcotic*, acting upon the cerebrum and producing symptoms like those following poisonous doses of camphor, viz., vertigo, giddiness, and coma.

Myrrha possesses the power, in common with other gum resins, of stimulating mucous surfaces, and so influencing their relaxed condition in disease that the abundant secretion is checked; thus *bronchial catarrh* and *chronic cystitis* are improved; and it appears likewise to relieve *leucorrhœa* and diminish excessive secretion from the *cervical mucous surface*. Its reputed emmenagogue properties appear to rest upon very questionable foundation.

Locally, myrrh has a very beneficial tonic action upon *diseased mucous surfaces*, and may be applied to *spongy gums* and *aphthous conditions of the tongue* (see R. on page 427). *Foul ulcers* are likewise benefited by it.


Nectandræ Cortex—An astringent tonic (see Beberine).

Nitro-glycerine acts like Nitrite of Amyl, but its effects are more persistent. One or two of the official tablets cause in about 3 minutes, throbbing and fulness of the head, soon spreading

over the entire body ; the increase in the pulse rate, and flushing of the face, is considerably less than that resulting from amyl. The blood pressure falls, the temperature is but slightly depressed in ordinary doses, but giddiness and severe frontal headache often last for a considerable time. If the dose be increased the pulse and respiration are greatly quickened, paralysis of the motor and sensory centres of the cord occurs, the heart becomes very much weakened, and the respiration slower, and finally death from paralysis of the respiratory centre supervenes, and the blood assumes a dark chocolate colour, as in poisoning with nitrite of amyl and nitrites of sodium and potassium.

Hay believes that the activity of nitro-glycerine is due to the nitrous acid which is formed by its decomposition within the body. He shows that the astonishing activity of so small a dose as $\frac{1}{100}$ gr. is owing to its being absorbed unaltered by the stomach, which decomposes to a great extent the ordinary nitrites, and the *nascent* nitrous acid formed by its final decomposition in the blood and tissues exerts a more incisive action than the nitrous acid of a nitrite. (Nitro-glycerine is a *nitrate* of glyceryl.)

Murrell has found that excellent results follow its administration in *angina*, where its action, though not so prompt, is much more lasting than that of amyl. One tablet is given every 3 or 4 hours, and the dose gradually increased till 3, 4, or 6 be taken during the threatening of an attack.

 The writer believes that the method by which he employs this drug in *angina* will give better results than any other treatment of this serious malady. He directs the patient to break up each tablet into 8 or more portions, one of which he takes every 15 or 20 minutes during the day. There is really no difficulty in administering the drug so frequently, and patients readily adhere to the plan which saves them headache and malaise, and generally they appear unconscious of any action of the remedy when so administered save that the attacks are prevented. Larger tablets of the official strength are more convenient. The writer has never failed with the drug when so employed. The plan is based upon a study of its physiological action. In cases of threatening attack, of course a large dose should be given, and the effects kept up by small ones.

It has been successfully used in *epilepsy*, *Bright's disease*, *neuralgia*, *tinnitus*, *puerperal eclampsia*, *asthma*, *migraine*, &c. It has been given with elaterin in *myxædema*, and to cut short attacks of *renal* and *hepatic colic*, and *ague*. It may be given in 1 to 3 or 5 minim doses of the 1 per cent. solution. Small doses prevent *sunstroke*.

Nitro-glycerine will often prevent *sea-sickness*, and the writer

has noticed a peculiar effect which it sometimes produces if the treatment be commenced *after* sickness has already occurred, *i.e.*—the patient may continue to vomit but all feeling of depression and nausea disappear, and the physiological action of the drug does not take place. It is, however, a dangerous remedy to trust in unskilled hands.

Nux Vomica or Strychnine, in moderate doses, is found to act as a mild stimulant or exciter of the centres of those nerves going to supply the striped muscular tissue of the body. Experiment proves that its characteristic effects are not produced by its action upon the brain nor upon the muscles themselves, nor upon the nerve-trunks or endings, but only on that part of the cord where the motor *centres* are situated. A large dose acts as a violent irritant to this part of the nervous system, and also to the vaso-motor and respiratory centres, causing convulsions of all the voluntary muscles, soon followed by spasm of the respiratory apparatus, and causing death by rigidity of the diaphragm and thoracic muscles.

After death the motor nerves are found to be impaired, owing to the exhaustion caused by the violent contractions preceding death, and only slightly through a direct action of the poison upon the nerves themselves.

The vaso-motor centre is stimulated, and the arterial pressure rises. This rise is exaggerated by the asphyxial condition induced by the convulsions, the blood being loaded with CO_2 , which irritates the vaso-motor centre still more. The violent contractions of the muscles retard the circulation in the adjacent vessels, and the blood pressure is thus further increased. The cardiac ganglia are stimulated; and the least stimulus, as a draft of air, produces powerful reflex spasms.

The symptoms closely resemble those of tetanus, but rigidity does not begin in the muscles of the jaw; the convulsions are *tonic* in tetanus, and *clonic* in strychnine poisoning. The phenomena after the administration of strychnine come on rapidly, and soon pass off, or are fatal; and there is no history of a wound or operation, as in tetanus.

Small doses after a time stimulate the *sensory nerve centres*, so that ordinary sensations are felt with unusual sharpness and keenness. The special senses and mental faculties thus are also quickened. In large or poisonous doses the mind is not further affected but remains clear to the last.

Owing to its stimulating action upon the reflex function of the cord, strychnine is useful in the treatment of many neurotic affections. In *paralysis* it is invaluable when given in suitable cases. Thus, in *hemiplegia*, *paraplegia* of *reflex origin*, and in various forms of *local paralysis*, strychnine is the most service-

able remedy we possess ; but it should not be given—(1) in recent cases ; (2) whilst *rigidity* exists ; or (3) in cerebral paralysis with continuance of head symptoms ; (4) nor is it of much use where *great* wasting or fatty degeneration of the affected muscles is present ; nor (5) where the muscles do not respond to the electric current.

Various spasmodic diseases are said to be cured by strychnine—*chorea*, *asthma*, and *epilepsy*.

Strychnine acts most beneficially upon the alimentary canal ; being a pure bitter it increases the tone and vascularity of the stomach, improves appetite, and promotes digestion ; and in *atonic dyspepsia* and various *chronic catarrhal affections* of the gastric mucous membrane it acts as an excellent tonic. Further down the canal its effects are even more marked ; by its stimulating power over the reflex action of the cord, it greatly increases the muscular contractions of the intestinal tube, counteracting *constipation* and *fecal accumulations*, and affording a valuable addition to purgatives. These effects are so marked that occasionally the stools are much altered in size, and may be seen to present the attenuated appearance observed in stricture of the rectum.

In the same way it proves useful in *prolapsus* of the *anus* and *atony* of the *bladder*, and has a strong aphrodisiac effect, and is useful in *sexual debility*. Functional *amaurosis* often very rapidly yields to strychnine in $\frac{1}{20}$ gr. doses. By stimulating the respiratory centre it relieves the *night sweats of phthisis*.

In *local paralysis*, the hypodermic injection of strychnine will be generally found to give splendid results. $\frac{1}{60}$ to $\frac{1}{30}$ gr. injected into the muscular substance is soon followed by increased growth and power. As a rule, it is said to be useless where the muscles will not respond to the slowly interrupted current, but beneficial results will, undoubtedly, follow its use in many cases where electrical stimulation cannot be induced. Barwell injects $\frac{1}{20}$ to $\frac{1}{12}$ gr. in *infantile paralysis*, but it is not advisable to begin with more than two or three minims of the official liquor.

Strychnine accumulates in the system by causing contraction of the renal vessels which prevents its own elimination, and its administration should be carefully watched. In a case of poisoning where death *almost* resulted, the writer found that the urine afforded not the *slightest trace* of strychnine, though the patient had been convulsed for 7 hours.

It is advisable not to begin with a larger dose than $\frac{1}{30}$ gr., which may be gradually increased to the $\frac{1}{12}$ gr. 10 to 12 minims of the tincture of nux vomica, or $\frac{1}{2}$ gr. of the extract, will be enough for a fair dose. Death has resulted in man from $\frac{1}{2}$ gr. strychnine.

Brunton recommends 5 to 10 minims of the tincture of *nux vomica* as an hypnotic in *sleeplessness* from over-work.

By its quickening or stimulating effect upon the sensory centres, the writer has found strychnine to be generally injurious in various *hysterical* and *nerve ailments* where there is undue irritability of the peripheral sensory fibres. It acts more powerfully from the rectum than if swallowed.

Strychnine is antagonistic to chloral and alcohol, and the writer believes that poisonous doses of alcohol afford the safest and best hope of success in strychnine poisoning. Since making this statement about the antagonistic effects of alcohol and strychnine in the first edition of this work, many observers have noticed that strychnine is antagonistic to alcohol, and strongly advise its use in *chronic alcoholism*.

The following forms will be found convenient for the administration of *nux vomica* and its alkaloid :—

(*A good Tonic in Dyspepsia or Paralysis.*)

R. *Tinct. Nucis Vomice* ℥v.
 Acid. Nit.-Hydrochlor. Dil. ℥vj.
 Tinct. Aurantii ℥j.
 Inf. Gentianæ Co. ad ℥x. *misce.*

Fiat mist. cujus cpt. ℥ss. mensura ex ℥i. aquæ ter in die ante cibos

(*Pills for Constipation.*)

R. *Ext. Nucis Vomice* gr. ss.
 Ferri Sulph. Exsic. gr. j.
 Ext. Aloes Socotrinæ gr. $\frac{1}{4}$.
 Pulv. Glycyrrhizæ gr. iss. *misce.*

Fiat pil. mitte tales xxiv., i. mane nocteque sumend.

Olivæ Oleum, given in ounce doses, produces soft, painless motions, and, by its soothing qualities, it protects the bowel from contact with irritating secretions, foreign matter, or partially digested food. Thus it is highly beneficial in *constipation*, *inflamed* or *ulcerated hæmorrhoids*, and *fissure of the rectum* or *anus* ; it is especially useful as a laxative, in $\frac{1}{2}$ to 1 oz. doses, in cases where the bowels have been locked up by opium. In small quantities it is a nutritious food. Its hypodermic administration has been advocated.

In 6 oz. doses, 12 hours after the administration of a blue pill, gall stones are said to have been passed in great quantity, and 20 to 40 oz. have been administered by some physicians with equally good results.

Externally, its bland unirritating qualities have obtained a place for it in liniments, poultices, and ointments.

Opium and Morphine resemble each other so closely in their action that the description here given will apply to both.

A moderate dose of opium will act upon the alimentary tract from the mouth to the anus; dryness of the lips, tongue, throat, and gullet will be evident in a very short time, secretion being stopped or diminished; gastric juice ceases to flow, digestion is retarded, and the appetite fails. The intestinal fluids are not secreted as before, and constipation ensues after a time. Arterial tension slightly rises, the pupils contract, and the nervous system is influenced; first, there is a sense of pleasant activity of the cerebral faculties, ideas flow with speed through the mind, and exhilaration bordering upon mild intoxication may be noticed, soon followed by a calm of variable duration, which passes into drowsiness and sleep; often the stage of mental activity is absent, and it is always best marked in those accustomed to the use of the drug.

Headache, mental confusion, and malaise, with digestive disturbance, often remain after waking.

In fuller doses the above symptoms are present, only in greater intensity; the stage of stimulation is *shorter*, the somnolency comes on swiftly, and soon passes into sleep, with irregular slow breathing, and, if the dose be large enough, coma supervenes. In poisonous doses sleep comes on so rapidly that the excitement stage is not apparent. The pupils are strongly contracted, the breathing, at first slow and stertorous, becomes feeble and irregular, the face is cyanosed, and the skin cold and moist; the pulse, at first full and strong, becomes feeble and rapid; the coma, at first incomplete, and out of which the patient was easily aroused for a time, becomes more profound, until finally no stimulus appears to arouse the least response, and death occurs from asphyxia, caused by paralysis of the respiratory centre.

Opium checks every secretion in the body except that of the skin and mammary glands.

Only the higher cerebral centres are affected by full doses, but if repeated, gradually the basilar ganglia are influenced. The spinal cord does not escape, as may be often noticed by the retention of urine following large doses, and the sensory nerve fibres throughout the body are more or less under the spell of opium, for sensibility becomes diminished, apparently by the conductivity of the impressions being less perfect. Brunton

found that opium influenced the peripheral terminations of the vaso-motor nerves, and thus diminished or prevented the reflex dilatation of the vessels, which always occurs when local irritation is present. This, he thinks, is the probable explanation of how opium cuts short inflammations.

These two distinct effects produced by opium—cerebral *excitement* in the first instance, and *sleep* afterwards—vary very much in different individuals, and also to some extent depend upon the way in which the drug is administered. Thus, in nervous excitable women, the first effect may be the only one noticeable, sleep not following; while, again, a very large dose will likely produce only the second effect, no excitement, or only a momentary flash being observed, sleep quickly supervening. By graduating the dose, the opium-eater can avoid the second stage, and prolong the excitement indefinitely.

Sleep results from the power of the drug to diminish or depress the functional activity of the cerebral cells, and at the same time to produce a state of anæmia of the brain, in which both arteries and veins are less full. The extreme contraction of the pupil, characteristic of opium poisoning, is clearly *centric*.

The effects of opium poisoning upon the pulse are explained by the action of the drug upon the inhibitory cardiac centre at first causing the slow full beat; the intracardiac ganglia also are at first stimulated, and afterwards greatly depressed.

Nothnagel, on opening the abdomen of a rabbit in a salt bath, found that the application of a sodium salt to the intestines caused an ascending constriction. Small doses of morphine prevented this, whilst larger doses exaggerated it, and he found by further experiments that this exaggeration was caused by the morphine *stimulating the inhibitory nerves of the intestines* through the splanchnics.

Large doses injected into the jugular purge rapidly by tetanising the intestine. Moderately large doses paralyse the vermicular contraction, while minute doses (1 drop laudanum) have been found by Brunton to increase it. He also noticed that by allaying the reflected irritation caused by an inflamed ovary with a small dose of opium, purgation took the place of constipation.

These hypnotic and anodyne qualities of opium render it the most important drug in the Pharmacopœia, and its application in disease is so extensive that only a brief reference to its numerous therapeutic uses can be made.

To produce *sleep* in all conditions requiring it, in the restless *delirium* of fevers, and in *nervous prostration* from whatever cause, opium is one of the best hypnotics; its good effects are seen in *delirium tremens* and in *acute* and *chronic mania* and

melancholia. It is contra-indicated when the brain is congested and the eyes suffused and pupils small.

As an analgesic or pain reliever opium or morphine surpasses all others in certainty of action and safety. It relieves the pain of *sciatica*, *neuralgia*, *lumbago*, *gastralgia*, and *cancer*, and soon removes the agony caused by the passage of *renal* or *hepatic calculi*. In these cases the hypodermic injection of morphine is by far the best form in which to administer the drug, and it is a mistake to regard its effects as merely palliative, for *sciatica* is sometimes *cured* by a single insertion of the needle, a result which is not met with when morphine is given by the mouth. The physician must guard against the patient getting into the habit of using the syringe too often, as there is great danger of the opium habit becoming established; and though space prevents any description of the evils arising from opium eating, a word may be said about its treatment. The writer has, after trying various plans, found success to crown the following:—He first gets the patient to resolve upon breaking off the habit, and he then has whiskey administered to him in such doses as to keep him markedly under its influence for several days, at the end of which time the case is treated as one of ordinary alcoholic excess, except that the spirit is gradually withdrawn.

Though this plan is open to the risk of establishing a more terrible disease than that which it is intended to cure, still it appears worth trying, but should only be used in cases where a considerable remnant of will remains. The writer succeeded with it completely in one hopeless case.

Cough is relieved by opium, but discrimination should be exercised in the exhibition of the drug for this purpose. In cases of *exhausting bronchitis*, with *profuse expectoration*, where there is only enough cough to empty the tubes, this remedy is a dangerous one; but where a harrassing, frequent cough wears down the patient's strength, without much secretion, then opium is a blessing. It acts in these cases by diminishing the excitability of the respiratory centre.

In *acute inflammation* opium gives the best chance of cutting short the disease and guiding it to a safe termination. If given at the very onset of formidable affections like *acute peritonitis*, opium may be safely taken to a surprising extent; and the amount of pain present affords the safest measure for the dose. Drachm doses of the tincture may be in such cases administered, and to guard against the risk of its lying in the stomach and being suddenly absorbed after an interval, it is wise to give it in several ways alternately—endermically; by the mouth or rectum; or hypodermically. It has long been a recognised fact that

opium given with no sparing hand will often save life in *severe inflammations*, especially of *serous membranes*.

The peristaltic action of the bowel is diminished, and thus it is doubly useful in *inflammation* of the *peritoneum* and *intestinal hæmorrhage*; and from its tranquillising effect upon the circulation it is our sheet anchor in *hæmoptysis* and other *hæmorrhages*.

Small doses ($\frac{1}{10}$ gr. opium) have been found successful in the treatment of *irritative dyspepsia*, by Graves; and all *enteric affections*, with excessive secretion, after the irritating cause has been removed by purgatives, are benefited by opium;—thus, *dysentery*, *enteritis*, *cholera*, &c., are so relieved.

After *abdominal surgical operations*, a morphine suppository is followed by great benefit, and opium has been found useful in averting the rigor liable to follow *urethral irritation*. The presence of severe pain is always an indication for a large dose of this drug; women are more susceptible than men; children bear opium badly, and the physician will be wise who makes the rule, in the first few years of his practice, never to give opium in any form to a child under a year old. Gout and renal disease have been said to be barriers to the use of opium; but recent experience shows that the hypodermic injection of morphine may be beneficial in *uræmic convulsions*.

Idiosyncrasy influences the dose of the drug, some bearing very small doses badly; and the after evil consequences—headache, nausea, intolerable itching, &c.—vary much in different subjects. Those accustomed to its use can take enormous doses of the drug.

The various alkaloids found in opium produce different effects when administered separately—thus:

Morphine, Narceine, and Papaverine are highly hypnotic; while Thebaine and Codeine are exciting, acting as convulsants, and Apomorphine is a violent emetic; but it is generally only with morphine that the physician has to deal. It differs from opium in being (1) less astringent and constipating; (2) less powerful as a diaphoretic; (3) it possesses less power over acute inflammations, especially in the abdomen; (4) it is less likely to cause excitement, headache, and nausea; (5) it is more decidedly hypnotic and anodyne, and more liable to cause itching and retention of urine.

Morphine and atropine are antagonistic to each other, and the dangerous symptoms often following the hypodermic injection of morphine are certainly less likely to occur if $\frac{1}{100}$ gr. of atropine be added to each dose, and the combination is more effective. Not more than $\frac{1}{8}$ to $\frac{1}{4}$ gr. of morphine should be given for the first time by the hypodermic method.

Of the various official preparations, none equal in certainty and uniformity a pill made out of the crude opium; powdered

opium is about $\frac{1}{8}$ stronger. They may be given in 1 to 2 gr. doses ; and next to them in constancy comes the tincture, which generally produces sleep in $\frac{1}{2}$ dr. doses. The bimeconate of morphine produces very little after ill consequences. The favourite Dover's powder expends itself chiefly upon the skin, which it stimulates more than a much larger dose of either its constituents would do if given singly. 1 gr. of morphine is equal in power to about 6 grs. opium.

☞ For Poisoning by opium see Poison Index.

R. *Liq. Morph. Hydrochlor.* ℥ss.

Aq. Laurocerasi ℥.xv.

Pot. Bromidi gr. xxx.

Aquæ Chlorof. ad ℥i. *misce.*

Fiat haustus, hora somni sumendus.

Os Ostum—Bone ash is only employed in the making of phosphates of calcium and sodium.

Ovi Albumen—The liquid white of the egg—consists of about 14 parts coagulable albumen, 3 of mucus, and 83 of water, with traces of salts, and it is highly nutritious, supplying to the blood an element which is found in most tissues. It is introduced as a test for metaphosphoric acid in Acid. Phosph. Dil., and it is used to coat pills and clarify liquids.

It is used as an antidote in poisoning by salts of mercury and copper, as it forms insoluble compounds with these.

Ovi Vitellus—Egg-yolk is highly nutritious, consisting of nearly 30 per cent. of oil and crystallisable fat and 18 per cent. of albumen and some phosphorus. It is used in making emulsions, and enters into Mist. Spt. Vini Gallici.

Oxymel and Oxymel Scillæ. (See under Mel and Scilla).

Papaveris Capsulæ resemble opium in their action, which is feeble and uncertain ; the extract, when carefully prepared, is a good hypnotic, not so liable to cause headache and nausea as opium. The decoction of poppies has long enjoyed a reputation as an anodyne when applied to various local inflammations ; its good effects are partly owing to the moist heat of the application.

Paraffinum—Hard paraffin is introduced into the B.P. to make a firm, bland, and unirritating basis for various ointments. Its high melting point, hardness, and unchangeableness confer special obvious advantages upon ointments containing it.

Soft Paraffin, Petroleum Jelly, or Vaseline, or Petrolatum, is

not affected by the majority of substances, and exhibits little tendency to become rancid. The absence of irritating or changeable constituents in it, and its absolute freedom from taste, smell, and grittiness, render it a good basis for ointments.

It is insoluble in water, and mixes with oils in all proportions, and it dissolves most alkaloids. It is, however, not a good basis if we wish to get these substances *absorbed*.

Its low melting point is a disadvantage, as when applied to the skin it melts and becomes quite liquid, and soaks into the dressings or garments, often leaving the incorporated substance almost dry and in direct contact with the skin; the addition of hard paraffin, as shown by Martindale, obviates this, and a faultless basis is obtained by a mixture of these two substances. There will occasionally be met with, patients in whom vaseline will cause considerable cutaneous irritation. Lard or any bland animal oil should be used when we wish to obtain the absorption of the active ingredient by the skin. Thus ointments of the alkaloids should be made with lard, whilst the antiseptic remedies, as carbolic, boracic, and salicylic acids, eucalyptus, &c., should be compounded with vaseline.

Alone, it forms an excellent and bland application to *eczema*, *intertrigo*, *burns*, *sores*, and *scalds*.

Paraldehydum is an hypnotic, and resembles chloral in its action, only it has no depressing effect upon the heart. It acts as a diuretic, increasing notably the amount of urine, but has no diaphoretic action. It has been given in *mania*, *melancholia*, *sleeplessness* from various causes, always with success, and does not cause digestive or cerebral disturbances afterwards. Dose—1 dr. in water. Its only drawback is its rather unpleasant, chloroform-like odour, which affects the breath for many hours, and its sharp, disagreeable taste. It may be given in peppermint water and syrup or in almond mixture. The sleep which it produces is calm and refreshing, like natural slumber. It produces no excitement, and is more speedy in its action than chloral. It is especially valuable as a safe hypnotic in the *insomnia* of *cardiac diseases* and *mania*.

℞. *Paraldehydi* ℥j.

Tinct. Aurantii ℥iij.

Aquæ Menthæ Pip. ℥iss. *misce.*

Fiat haustus, hora somni sumendus.

Pareiræ Radix in large doses acts as a mild laxative. After its absorption, it is eliminated by the kidneys, which it stimulates, thus acting as a diuretic; and, as the active principle passes over

the mucous membrane of the genito-urinary tract, it exercises a soothing and tonic influence on the bladder, and in cases of *chronic cystitis* the excessive secretion is diminished. In the same way *suppurative kidney affections* are relieved, and sometimes unhealthy conditions of the *urethra*, causing *gleet* and smarting pain after micturition, are relieved by pareira. Its effects are intensified by combining it with alkalies, and the liquid extract is the best preparation. Its active principle undergoes change in the blood, for when injected for *gonorrhœa* and *cystitis* it does not appear to have any local beneficial action, though it appears to act like an ordinary tonic when admitted to the stomach.

R. *Ext. Pareiræ Liq.* ℥ij.

Liquor. Potassæ ℥iv.

Decoct. Pareiræ ad ℥x. *misce.*

Fiat mist. cpt. cochleare amplum tertiis horis ex cyatho vinosa aquæ.

Pepsin (the chief principle found in the gastric juice) is a ferment or enzyme, possessing the power in presence of warmth, acidity, and moisture of converting albuminoid and proteinaceous foods into peptones. Pepsin will work this change outside the body, and there can be no doubt that a similar action takes place in the stomach when pepsin is administered. The deficiency of gastric juice, moreover, is known in many cases of *atonic dyspepsia* to be the direct cause of the indigestion, and hence the value of pepsin. In *irritative dyspepsia*, with excessive secretion of acrid gastric fluid, pepsin does harm unless given in one very large dose (30 grs.) Lactopeptine will be found a satisfactory form for administration.

Three facts should be remembered in prescribing pepsin—(1) that it is a *ferment*, and large doses are not generally necessary, since its activity depends more upon the *state* of the stomach's contents than upon the *amount* of the ferment administered; (2) that it acts as a direct stimulant to the gastric mucous membrane, which it causes more copiously to pour out its own secretion; and (3) that in the class of cases most requiring pepsin *an acid is also necessary*. It is recommended in the *diarrhœa of children*, depending upon the presence of quantities of partially digested food passing along the intestines. It is useful in some forms of *vomiting* and *nausea*, probably caused by imperfect digestion, but there is said to be danger in giving pepsin in cases of gastric ulcer, as it might reach the liver unaltered. Large doses of pepsin will be found to act as a mild purgative.

If added to *nutrient enemata* it greatly increases their chances of being absorbed. It has been applied to the false membrane in *diphtheria* with the view of causing its digestion. It has been used in *diabetes* by Giovanni.

Phenacetin possesses decided and valuable antipyretic and analgesic powers. It reduces fever heat with safety and certainty, in doses of 8 to 12 grains, which may be given every eight hours. It has been used in all the conditions in which antipyrine and antifebrin are indicated. It has so far been found not to possess any toxic properties. D-Beaumetz has given it as an analgesic in daily quantities of from 15 to 30 grs. for months in every variety of pain always with success, and without harm resulting. *Migraine, neuralgia, acute rheumatism, and ataxy* pains all speedily yield to it. Every form of fever and high temperature also are favourably influenced by it. It is best given in the form of powder, swallowed with water. The fall in the temperature lasts four or more hours, and there is generally some sweating, but no rash or cyanosis. It is best given in the evening, and 2 to 4 grs. may be given to children.

Phenazonum produces convulsions in the lower animals in poisonous doses, and it paralyzes the frog's heart, and, though moderate doses increase the blood pressure, large doses cause it to fall; and the colour of the blood is altered. The chief action of the drug is upon the temperature. This is very slight in health, and is not to be compared to the rapid and certain fall which takes place in fever. It may be taken as established that this reduction of temperature is the result of *diminished production* of heat, and this is produced by its action upon the heat centre situated in the corpus striatum. Metabolism is markedly checked and the urea diminished. Sweating occurs, but it in no way explains the fall in the temperature. The reflex excitability of the cord is much depressed, and, ultimately, anæsthesia results. The drug is eliminated in the urine. Antipyrine has been given in nearly every disease with high temperature and almost every conceivable feverish condition:—*typhus, typhoid, scarlatina, rheumatism, erysipelas, and pneumonia*. Though useful, its benefits are less marked in scarlatina and erysipelas. There is, perhaps, no condition in which its antipyretic virtues are more apparent than in *phthisis* with high temperature. 10 grs. in water, and 10 grs. in one hour, and 5 grs. in one hour again, will be found a full and satisfactory dose. The temperature may be found to drop as many as 10° F., with relief of all the symptoms and distress for the time. Formerly these doses were doubled, and the drop often lasted 20 hours. Small and frequently repeated doses, though safer, are not satisfactory. It may be given hypodermically or by rectum. Though this treat-

ment cannot be said to be curative, in selected cases its benefits are most marked. Often the temperature falls without sweating; there is often some cyanosis and even collapse followed by a rash. It is calculated that 10 times the above dose would be required to make a decided impression on the body heat in health.

In the febrile diseases of childhood ($1\frac{1}{2}$ grs. per year) it may be given hourly for 3 doses. In continued fevers in the adult 30 grs. in divided doses may be given morning and night, as soon as the temperature keeps above 103° . The temperature should be taken frequently, as sometimes only the first portion of the dose needs to be administered. Giddiness and collapse can be successfully treated by atropine hypodermically. Much difference of opinion exists regarding the relative safety of antipyrine or antifebrin, and though the latter is generally regarded to be less liable to depress the heart and produce collapse, the writer's experience is in favour of antipyrine, and he only once saw any inconvenience arise in many thousands of administrations, and this was from a *small* dose per rectum in a patient who had taken *large* doses for days with impunity.

In addition to its antipyretic action it is a powerful hæmostatic when administered internally or applied locally, and the writer believes that a strong solution should act well in *post-partum* hæmorrhage; it controls epistaxis. Antipyrine is one of the most certain of analgesics, and there is hardly any pain which is not relieved by it. Its effect in *migraine* has been, in the writer's hands, almost magical. In nearly every form of headache and neuralgia, swallowed in doses of 15 to 20 grs. and repeated often, it generally gives speedy relief. The lightning pains of *ataxy* and the *gastric crisis* are cut short by it. Aneurismal and anginal agony also yield to it. After the relief of pain sleep often follows. The pains of labour are rendered bearable, and if ergot be administered it is said almost painless labour may result; *dysmenorrhœa* may be relieved. The drug has also been given with success in *diabetes*, *sea-sickness*, *epilepsy*, *nocturnal emissions*, *asthma*, *hæmoptysis*, and *laryngismus*. Hypodermically 5—15 grs. in water will relieve local pain and neuralgia like morphia, but it causes smarting and local sores.

In *pleuritis* it is claimed that small doses cut short the attack, and have a surprising effect upon the absorption of the effused fluid. The writer is satisfied that 5 to 10 grs. every 3 hours give the most satisfactory results in *influenza (Grip)* and in *inflamed sore throat*, and if the drug be given early in the first named disease the attack is modified and complications do not occur, and a fatal issue is exceedingly rare.

Phosphorus in *minute* doses is a tonic and stimulant to the nervous system, probably by acting as a restorative and supplying food to nerve tissue. The mental faculties seem more active, the circulation is quickened, and the pulse rises; the temperature is said to rise also; the products of waste are increased in the urine; and the appetite increases, whilst the nutrition of the body also is improved. After a considerable time the bones are affected, osseous deposit filling up the medullary canal, and it has been proved by Wegner that the cancellated tissue becomes compact bone.

In larger doses, vomiting, purging, albuminuria, and the ordinary signs of irritant poisoning supervene, only they may first show themselves *several days after the first dose has been taken*—with cardiac weakness, reduction of temperature, jaundice, convulsions, and death, after which are found fatty degeneration of the liver, blood-vessels, and muscular tissue generally. These symptoms are not unlike those observed in *acute yellow atrophy of the liver*.

In chronic phosphorus poisoning the hepatic connective tissue is increased and cirrhosis results, with marked fatty degeneration. This latter change is produced by the *increased metabolism* and *diminished oxidation* which characterise the action of the drug, the fat being derived from the rapid splitting up of the albuminous tissues of the body.

From its restorative effect upon the nervous system, phosphorus has been extensively tried in *neuralgia*, on the ground of this affection being always associated with a more or less impoverished condition of the diseased nerve. Sometimes benefit follows its administration, but more frequently it fails utterly. It is valuable in cases of *simple brain exhaustion* from prolonged mental strain; and in many diseases characterised by wasting or atrophy of the nerve centres its good effects have been occasionally observed. It acts upon the centres which preside over the *reproductive act*, and is an aphrodisiac in cases of functional loss of power.

In affections depending upon mal-nutrition, as *pernicious anæmia*, or *leucocythæmia*, phosphorus will be found useful. Kassowitz has reported the results of 560 cases of *rickets*, and states that cranio-tabes of a most marked character, involving both the occipital and parietal bones, disappeared completely in from four to six weeks, and children, who had never been able to stand or sit upright, were found running about after taking phosphorus for one or two months. The dose for a child 12 lbs. weight was from $\frac{1}{120}$ to $\frac{1}{60}$ gr. in the day. The writer in his Dictionary of Treatment has ventured to point out a possible danger in giving this drug in some cases of rickets, as it may cause the bones to harden in their bent condition. Phosphorus

has been used in *tubercular meningitis* and *diabetes*, but with very doubtful benefit. Its stimulating action upon the skin has led to its questionable employment in developing the suppressed rashes of the eruptive fevers, and as a substitute for arsenic in *chronic scaly skin diseases*. From its influence over the growth of bone, it will be of great service as a constitutional treatment for *un-united fractures*, especially during pregnancy.

The *fumes* of phosphorus cause disease of the jaws, leading to exfoliation of the bone; this action is a local one, caused by the vapour reaching the alveolus through a decayed tooth. It does not follow the internal administration of the drug, even in poisonous doses, and only affects those exposed in the manufacture of lucifer matches who have caries of the teeth.

Not more than $\frac{1}{80}$ grain should be given at first, and its effects should be carefully watched. The phosphorated oil may be given in gelatine capsules, each containing 5 minims, or 3 grs. of the recently prepared official pill may be prescribed. The writer prefers to give it in rickets in combination with cod liver oil,—40 minims of B. P. phosphorated oil mixed with 6 ounces cod liver oil—the dose of the mixture being 1 dr.

For *Phosphate* and *Hypophosphite of Calcium* and *Phosphoric Acid*, see under Calcium and Acid. Phosphoricum. None of these substances possess the therapeutical virtues of free phosphorus—which enters the system and remains in the blood as the element, phosphorus—and not, as has been supposed, after its conversion into phosphoric acid or a salt. Compounds in which the affinities of phosphorus are not completely saturated, produce poisonous results, not unlike phosphorus. They are not, however, used medicinally.

Physostigma and Eserine — Calabar bean is a deadly poison, long used by the West Africans as an ordeal for determining the guilt or innocence of suspected witches.

Minute doses cause vomiting, colic, and diarrhœa, and stimulation of the voluntary and involuntary muscles throughout the body, with increase of blood pressure and salivation. Repeated doses of $\frac{1}{2}$ gr. of the alcoholic extract soon produce more serious symptoms—the *anterior*, and to a less extent, the *posterior cornua of the cord* become depressed, producing motor paralysis, extinction of reflex irritability, and only partial loss of sensation. The cerebrum remains unaffected and the mind is clear; the pupils contract; the respiratory centre is soon paralysed, producing death by asphyxia, through stoppage of the respiration. The heart, at first stimulated, becomes finally depressed.

Physostigma contains two alkaloids—Eserine or Physostigmine, and Calabarine; the former produces effects resembling

those produced by the bean itself, whilst the latter causes tetanic convulsions like strychnine. They are excreted by the saliva and bile, but not by the urine.

Calabar bean is antagonistic to strychnine and atropine, and may be tried in cases of poisoning by these drugs. It has been used in *tetanus*, and in various convulsive diseases, in *chorea*, *paralysis agitans*, *acute mania* and *general paralysis of the insane*, and in minute doses for *chronic constipation* and *bronchitis* with the view of stimulating the involuntary muscular fibre ($\frac{1}{3}$ grain of the extract). It should be given hypodermically. It is for its local action that Calabar bean is so valuable in ophthalmic practice; the alkaloid—Eserine—applied to the conjunctiva produces contraction of the pupil, diminishes intra-ocular tension, and causes spasm of accommodation. The official discs or a few drops of a solution of the sulphate (2 grs. to 1 oz.) are used for this purpose—(1) to counteract the effects of atropine; (2) to prevent prolapse of the iris after *wounds of the cornea*; (3) to diminish the amount of light falling upon the retina in hypersensitive states or inflammations of the eye, as in *strumous ophthalmia*, *ulcers*, &c.; (4) to diminish intra-ocular pressure in *glaucoma* and *perforating keratitis*; (5) used after atropine, to break down the adhesions resulting from *iritis*. It has proved beneficial in *detachment of the retina*.

Picrotoxin, externally as an ointment (1 gr. to 1 dr.), kills *pediculi*, but it must be used with caution. Internally it is, in doses of a few grains, a powerful poison, irritating the respiratory and other centres in the medulla, and producing violent spasmodic muscular contractions from its stimulating action upon the cerebral and spinal motor centres. It has been used in *epilepsy*, especially in the nocturnal variety; in *paralysis* affecting the muscles of the pharynx, and in *sick headache*. It is, however, to check the *night-sweating of phthisis* that this drug has been much used, and good results have been obtained by Murrell, who first introduced it, in doses of $\frac{1}{200}$ to $\frac{1}{100}$ gr., three times a day.

It may be given in pills, and the dose increased to $\frac{1}{25}$ gr., or in solution with a little acetic acid; or hypodermically, $\frac{1}{50}$ gr. It is antagonistic to the action of chloral hydrate.

Pilocarpine.—See Jaborandi (page 425).

Pimento, like cloves, is a stomachic, and though in large doses it acts as a stimulant of some power, still it is seldom employed in medicine, except as a flavouring ingredient or adjuvant to purgatives. Like pepper, it improves digestion, and increases the vascularity of the mucous membrane when mixed with food. Hence it may be taken as the type of a condiment.

The essential oil, in 3 to 5 minim doses, is an agreeable remedy for *flatulency* and *colic*.

Pini Sylvestris Oleum acts in a similar way to turpentine. It has been used as a mild rubefacient in *chronic rheumatism* and various rheumatic and *joint* troubles. The vapour, by its stimulating and astringent effect upon the inflamed bronchial membrane, has been successfully used in *laryngitis*, *bronchitis*, and *phthisis*. It has also been used as a bath in *rheumatism* ($\frac{1}{2}$ oz. to 80 gals. of hot water).

Piper Nigrum resembles pimento in its stomachic qualities. It has been supposed to possess febrifuge properties, on insufficient evidence. It slightly increases the frequency of the pulse, and stimulates the heart. After circulation in the blood it is eliminated by the kidneys, which it stimulates, and certainly at times increases the amount of their secretion, but its diuretic action is uncertain; it imparts to the urine a characteristic odour. In passing over the genito-urinary tract it exercises a beneficial influence upon the bladder and urethra, and has the power of bracing up the relaxed and chronically inflamed mucous membrane of these parts in *gonorrhœa* and *gleet*. In this respect its action resembles that of cubebs; it may stimulate, by reflex action, the genital organs, and possibly aggravate matters in the acute early stages of the disease. It is not eliminated by the mucous membrane of the lower part of the alimentary canal, though patients often will report that a sensation of warmth and comfort is felt at the end of the gut after the free use of pepper. This is caused by the *excess* of the remedy which passes through unabsorbed, and pepper is decidedly beneficial in inflamed and relaxed conditions of the mucous membrane in the neighbourhood of the anus. In *hæmorrhoids* its good effects will be found by giving the official confection in tea-spoonful doses three times a day. If cubebs be added, and copaiba balsam substituted for the honey, a preparation results, which will seldom fail to arouse a healthy action in relaxed and painful affections about the anus; or the following may be used with or without the cubebs:—

R. *Pulv. Piperis Nig.*
 ,, *Carui Fructus*
 ,, *Cubebæ ana* *ʒss.*
 Glycerini q.s. misce.

Fiat electuarium cujus capiat cochleare parvulum ter in die.

Pix Burgundica is a mild rubefacient, and its physical qualities render it suitable as a basis for plasters. It is in this form that the drug is generally employed, and the good effects which have followed its application in *lumbago*, *rheumatism*, various painful *joint* and *nerve* troubles, have been attributed to some special stimulant or anodyne action which it was supposed to possess. It is, however, more likely that any good effect following the use of pitch, soap, resin, and various other plasters may be explained upon the hypothesis that the part after the application of the plaster is protected by it from variations of temperature, whilst the lymphatics are stimulated. The gentle pressure is productive of good, and aids absorption.

Burgundy pitch has been supposed to exert some special action upon the rectum, and has been employed for *hæmorrhoids*, made into pills with the following liquid.

Pix Liquida—Wood tar contains amongst its numerous and complex constituents some creasote and turpentine, upon which many of its properties depend. It is thus antiseptic and stimulating, and possesses considerable power in checking profuse bronchial secretion; it is also diuretic. But, since the improved methods of preparing carbolic acid have been extensively employed, tar as a remedial agent has fallen into comparative disuse. There are, however, virtues possessed by tar which are not equally enjoyed by its more fashionable rivals: for example, as an expectorant tar is decidedly superior to any compound which can be distilled from it. It probably exerts its beneficial tonic effects upon the bronchial mucous membrane in the act of its elimination. Yeo finds that tar exhibits its valuable expectorant qualities either when swallowed, inhaled as spray, or used as a fumigation. Ringer states that the administration of tar to patients with *winter-cough* has the power of diminishing the danger of "catching cold."

Tar possesses decided advantages over creasote and carbolic acid in the treatment of *chronic scaly skin affections*. It is a powerful stimulant when applied to a healthy sensitive skin, and often causes considerable inflammation and pain, especially in regions where there is much hair. In *psoriasis* the ointment of tar sometimes cures; and in *chronic eczema*, with painful itching, it occasionally will be found to relieve the itching, and, at the same time, to remove the disease which causes it. (See under Carbonis Detergens.)

The internal administration of tar in 5 or 8 minim doses, gradually increased to 15 minims, in pills or capsules, is employed by Anderson in *chronic eczema*.

Tar water is made by adding 1 part of tar to 10 of water, and, after agitation and subsequent rest, on being poured off it makes

a good stimulating lotion for *wounds* and *sluggish ulcers*. As a means of administering the remedy, it may be taken in wine-glassful doses ; 3 grs. of tar may be made into a pill with $1\frac{1}{2}$ grs. lycopodium.

Plumbum—All the salts of lead are more or less poisonous, though the acetate is the only one used internally, and when administered for a time give rise to definite and easily recognised symptoms. There is loss of appetite, wasting, pallor, and constipation, followed by slowing of the pulse and heart's action, with violent colicky pains, cramps in the flexor muscles, and evidence of muscular impairment, as seen in paralysis of the extensors of the forearm, causing drop-wrist ; occasionally headache, stupor, and convulsions are observed.

Lead becomes fixed in all the tissues, chiefly in the central nervous system, and is deposited in the affected muscles. These at first present no sign of change on the application of electricity ; but as the paralysis lasts the current seems to have less and less effect, till finally it does not cause any contraction, and the muscular fibres become the seat of fatty degeneration, and finally may lose all traces of striation. The change probably is of spinal origin, since it occurs in groups of muscles which act together. Other groups may be the seat of paralysis besides those of the forearm and hand ; the deltoid and the laryngeal muscles are occasionally affected, and paraplegic and even hemiplegic symptoms may show themselves, and finally the lead deposited in the brain may cause delirium, convulsions, and coma.

The joints get stiff and very painful, probably owing to gouty changes, for lead prevents the excretion of urates by hindering the decomposition of uric acid. The structure of the liver and kidneys becomes affected, causing slight jaundice and albuminuria. The urine, at first scanty, becomes abundant and clear. It has been recently shown that the red blood discs are destroyed. A blue line appears along the gums, near to the teeth, it is caused by the metal deposited in the tissue of the gums being converted into a sulphide by the action of sulphuretted hydrogen generated from the decomposition of fragments of food remaining between the teeth. It is best marked over the region of the incisors, and is absent or indistinct where the teeth are away.

The walls of the arteries contract, the blood pressure rises, the pulse slows, and becomes tense and full. The nervous system is seriously affected by lead, the changes in the sensory nerves giving rise to various neuralgic symptoms throughout the body ; thus, gastralgia and sciatica may give trouble, sensibility to touch becomes diminished, and especially about the upper part of the body may this be noticed. The optic nerve occasionally suffers, producing amaurosis. Harley considers that all the

effects of lead upon the system may be traced to the enfeeblement of the nerve currents from impairment of the isolating power of the nerve fibres.

Abortion often results from lead poisoning, either on account of the toxic power of the drug on the fœtus or from its influence over the muscular tissue of the uterus.

Lead is eliminated by the urine, bile, intestines, and skin.

As the different salts of lead have slightly different actions they may be referred to under their different names.

Metallic Lead is inert in the system till converted into a soluble salt by acids, as those of the stomach.

Acetate of Lead is a valuable astringent. It combines directly with albumen, forming albuminate of lead, and when a strong solution is applied to a fresh wound or sore, a film of this substance imperfectly glazes it over. It causes contraction of the vessels when applied in weaker solution; thus, it directly diminishes the blood supply, and checks excessive secretion in *ulcers, wounds, and most local cutaneous inflammations*. *Itching* is often relieved in this way, and a weak solution (5 grs. to 1 oz.) makes a good injection in *gonorrhœa* and *gleet*. In the painful, red, and inflamed stage of *eczema*, characterized by much serous discharge or weeping, lotions of lead give relief by constringing the small vessels, diminishing pain, itching, and discharge.

Lead Collyria should not be used in ulceration of the cornea on account of the danger of their forming opaque deposits in the tissue, interfering with sight.

Internally, the acetate finds its way into the blood, probably as an albuminate, and by its astringent effect upon the smaller vessels it diminishes the secretion of the bronchial tubes, stops *hæmorrhages*, as in *hæmoptysis*, and controls *diarrhœas*. 2 to 5 grs. may be given every two or three hours in these affections, and there is little danger of lead poisoning ensuing, even though its use may be protracted.

(For Active Hæmorrhage.)

℞. *Plumbi Acetatis* gr. xxxij.
Liq. Morphineæ Acet. ℥iss.
Acidi Acetici Diluti ℥j.
Aq. Destillatæ ad ℥viiij. *misce.*

Fiat mist. sumat cochlearia ii. ampl. secundis horis.

The *Sub-Acetate Solutions of Lead* act like the acetate, and are generally confined to external application, where their unirritating astringent action renders them invaluable in *local cutaneous or superficial inflammations*, and *erysipelas*.

A valuable astringent application to *sprains*, &c., may be made by mixing Liq. Plumbi Subacet. \bar{z} ss ; Acid. Acetic. Dil. 3j ; Spirit. Vini Rectif. \bar{z} iss ; Aquæ Rosæ ad \bar{z} xij.

Carbonate of Lead is only used externally as a sedative and astringent application to excoriated or inflamed surfaces, either in the form of ointment or in fine powder dusted over the affected spots ; white paint relieves the pain of *burns*.

The *Oxide* possesses similar desiccant properties, but is seldom used.

Nitrate of Lead has been used as an astringent in *onychia* and inflamed conditions of the nail. It makes an elegant astringent application, dusted in very fine powder over *cracked nipples*, and excoriations about the *mouth* and *anus*.

Iodide of Lead combines the alterative qualities of iodine with the astringent properties of lead. It is supposed to have a beneficial action in *scrofula*, but is seldom given internally.

Externally, it is used in the form of a plaster or ointment.

The plaster can only feebly produce any alterative action independent of the good effects of pressure, and of the covering up and protecting of the part from changes of temperature. (See below.) There is no evidence of the ointment entering the system through the unbroken cuticle, though recently it has been recommended as an application to the breast to check the secretion of milk ; it is highly efficacious in *ringworm*.

The various plasters containing lead most probably act entirely independent of their metallic constituent, which is not absorbed in this form into the system. The 10 preparations of which lead plaster forms the basis (except mercurial plaster) act mechanically, as before explained, by causing such pressure when properly applied as will alter the circulation, and, acting as a stimulus to the lymphatics, will assist the removal of effused products or *indolent enlargements*. By covering up the affected or diseased parts, they protect them from all sources of external irritation, especially from changes of temperature, and promote a more rapid interchange between the blood and the tissues, hastening repair, and at the same time, in the case of *diseased joints*, securing some degree of rest. The superficial spot so treated is placed upon the same favourable conditions as a deeper part.

In chronic lead poisoning, iodide of potassium is used to dissolve out the insoluble metallic compounds lodged in the nerves, viscera, muscles, and brain, but its administration must be backed up with purgatives, especially saline sulphates, which will cause removal of the soluble salts of lead eliminated by the intestines. Sulphur baths may be employed, and the tone of the affected muscles must be kept up by friction and the free use of the slowly-interrupted current. Alum has also been used

with success, and belladonna is very useful in lead colic and paralysis.

As a prophylactic treatment to those much exposed to the fumes or dust of the lead compounds, lemonade made with sulphuric acid, instead of citric or tartaric, has proved beneficial ; and a diet largely composed of milk has the power of preventing the poison affecting the system. Scrupulous personal cleanliness is a very important point.

Podophyllum root and resin are active cathartics. The latter is the form in which the substance is generally administered. It is an irritant when applied to the surface of the body ; and the dust produced by powdering it, coming in contact with the skin causes sores, and keeps the eyes in a state of chronic irritation. When given internally, the tongue and throat become inflamed in the same way, if the remedy is allowed to remain in contact with these parts for any length of time ; but as ordinarily given, in the form of pill or even diluted tincture, this effect is not noticed.

It produces free purgation, with watery stools, by irritating the mucous membrane and acting as a powerful stimulant to the intestinal glands, whose secretion it greatly increases. The most of its force is spent upon the duodenum, whose contents it sweeps rapidly down the tube, resembling in this respect calomel ; and hence the name frequently given to it of "vegetable calomel." The resemblance ends here, for podophyllin does not possess any of the *alterative* properties of calomel. Podophyllin will purge when injected into the veins, cellular tissue, or serous cavities, or if applied to an ulcerated surface.

In its action podophyllin closely resembles jalap, only ordinary purgative doses ($\frac{1}{8}$ to $\frac{1}{2}$ gr.) are more tardy in producing their effects, and are much more variable in their results upon different individuals. Sometimes $\frac{1}{4}$ gr. of the resin purges in a few hours, while $\frac{1}{2}$ gr. in another individual will not operate for 10 or 14 hours, and in a third may produce no purgation at all. Florid individuals, or those with much red pigment in their hair, may be often noticed to be very susceptible to the action of the drug. Often great pain results from the administration of podophyllin, especially from impure samples of the resin ; common salt increases the cathartic properties.

Rutherford found that it produced decided stimulation of the liver, and marked increase in the amount of bile secreted. The bile is its proper solvent, but if a large dose of the drug be given the hepatic secretion in which it is dissolved is not absorbed, but is swept along the intestines, and the liver is less stimulated than if only moderate quantities had been adminis-

tered. In doses sufficient to cause severe purgation the biliary secretion is decidedly diminished.

These effects upon the liver and intestines give podophyllin a high place in the treatment of various diseases of the *liver* and *bowel*; thus for passive congestion or *hepatic torpidity*, or *obstinate constipation*, $\frac{1}{4}$ gr. of the resin will be found a valuable remedy, relieving the portal circulation speedily. The danger of griping will be removed by the addition of extract of belladonna or hyoscyamus; and if combined with some good cathartic pill, as aloes or colocynth, its action is much more certain and uniform, though Wood believes that owing to the tardiness of its operation it should not be combined with speedy cathartics. He advises its combination with calomel, which takes about the same time to act. This must be also advantageous from another point of view, because calomel and podophyllin act upon the same portion of the small intestine, and must consequently intensify each other's effects.

By such a combination of purgatives as colocynth, podophyllin, jalap, and aloes, we get a more valuable hepatic stimulant than if any one be ordered singly in a large dose. By this means we also ensure an action possessed by no solitary drug, since the entire intestinal tract from the stomach to the anus is equally stimulated.

Rx. *Extracti Hyoscyami* gr. ij.
 Resinæ Podophylli gr. $\frac{1}{4}$.
 Extracti Colocy. Co. gr. iij *misce.*

Fiat pil. mitte tales xii., i. pro re nata, hora somni.

Potassium—The salts of potassium vary so much in their therapeutic action that a brief account of each separately will be necessary. They possess some properties in common; thus, all act in *large* doses as powerful poisons independent of the acid with which they may be chemically combined. The spinal cord and nerve centres are paralysed; the heart is depressed, and its movements rendered slow and irregular, and there is a fall of temperature and blood pressure.

One large dose of any potassium salt injected into the veins of an animal causes sudden arrest of the heart's action and death. Ringer believes that the potassium salts act as pure protoplasmic poisons, destroying all nitrogenous tissues, the more highly organised nerve centres suffering first.

After a time the blood becomes thin and poor when the administration is protracted, and there is loss of weight from absorption of the fat deposited throughout the body, the digestive

organs are interfered with, and large doses cause paralysis of the muscular coat of the stomach and intestines. In small doses these salts are restorative, supplying the place of those used up in the blood corpuscles and in muscle. Potassium salts exist normally in the *solid* tissues, whilst sodium salts abound in the fluids of the body. Most of them are diuretic and slightly purgative. The salts of potassium possess higher diffusive power and more readily enter the blood than the sodium salts. They increase the formation of *bile*. There are, in many points, close resemblances between the potassium and sodium salts, and they may be taken as the representatives of a very important chemical class of therapeutic agents—the alkalies. The potassium salts exercise a more depressing influence over the nerve centres and heart muscle than do the sodium compounds, and when it is found necessary to keep up the action of alkalies for a long period the sodium salts should be employed. (See under Sodium.)

The alkalies when admitted to the stomach act as direct stimulants, and notably increase the quantity of gastric juice when given before food; and thus their utility in *atonic dyspepsia*, and their power for harm in irritative gastric complaints. Ringer's law in reference to acids holds true conversely when applied to alkalies—*i.e.*, that alkalies check all alkaline secretions, while they stimulate all secretions of an acid reaction.

Potassa Caustica—From its affinity for water, and its power of dissolving albumen, this substance when applied to the tissues causes their rapid destruction, producing an extensive eschar. Its destructive action being both deep and wide, its use must be restricted to such parts where no vital organs or structures are within reach. Its deliquescent properties cause it to run over the skin if allowed to remain in contact with it long; hence it is desirable to circumscribe its action with a ring of adhesive plaster, or with some adhesive cerate of firm consistence, or it may be combined with lime.

When the solid stick is applied to the skin for the destruction of any very superficial part, a contact of short duration will suffice, and blotting paper should be applied to absorb the moisture, else the eschar will be much deeper than is intended. *Cancers of epithelial* origin may be often satisfactorily treated in this way. It was used for making issues, and is still employed in opening *abscesses* or *cysts* in the interior of the abdomen, or in the substance of the liver. A series of mild applications of the caustic excites such inflammation that the abscess or cyst wall becomes glued to the abdominal parietes, when it may be opened with the knife or with further applications of the caustic without any danger of the contents escaping into the peritoneal cavity. *Unhealthy, foul*

ulcers showing a tendency to spread by sloughing, may be destroyed with caustic potash, and its efficacy in various chronic indurated conditions of the *os uteri* is highly spoken of. In these cases the good effects are not so much owing to the destruction of diseased tissue as to the alteration in the diseased action which always follows the free use of the caustic. The caustic, apparently, acts as a powerful stimulant to the healthy tissues, hastening repair and growth, and substituting a healthy inflammation for some abnormal tissue change.

The deliquescent properties and severity of action are corrected by mixing it with rather more than its own weight of lime, and making it into a paste as required, with rectified spirit of wine ; this is known as Vienna paste—a safer, milder, and more manageable remedy than the pure caustic potash. Internally, it is never given in the solid state, since small quantities would act like the powerful corrosive poisons, and cause death by destroying the mucous membrane of the stomach and gullet.

Liquor Potassæ is the form in which caustic potash is administered internally, though if given in its undiluted strength it is a powerful corrosive poison. Applied to the cuticle it dissolves it, and is used for *in-growing toe nail*, with a view of softening the nail and facilitating its removal. As a lotion it is likewise useful in *skin affections*, where it may be employed either to partially dissolve or hasten the removal of scales, as in *psoriasis*, or to allay the itching of *eczema*, *urticaria*, &c.

Internally, when Liquor Potassæ or any solution of the hydrate (largely diluted) is swallowed it readily finds its entrance into the blood on account of its easy diffusibility, but it first neutralises any free acid with which it comes in contact in the stomach ; it acts thus as an antacid, either locally or after its admission into the blood.

Hence it has been used to check excessive acidity anywhere, as in *irritative dyspepsia*, or acid conditions of the urine, leading to uric acid deposits ; but if given in doses sufficient to produce this remote antacid effect it will be often found to irritate the stomach, and, consequently, it is not so valuable as the less irritating salts. It increases and liquefies the secretion in *bronchitis*, and has been given in the various forms of *rheumatism* and *gout*. It is diuretic to some extent, as it passes out by the kidneys, but it possesses less power (in safe doses) over the state of the urine than the citrate and carbonates. It does, however, cause an increase in the nitrogenous elements of the urine, possibly by encouraging the various tissue changes or destructive metamorphoses throughout the body, and not by any mere diuretic action of the drug. It has been used in *obesity*.

It appears to possess special sedative influence over the *bladder*

and *urethra*, and its use in various irritable conditions of these parts, caused by unhealthy urine passing over them, is more liable to be followed by good results than if any of the salts had been given, the bicarbonate excepted.

Small doses, given with a vegetable tonic before meals, increase the flow of the gastric juice by acting as a direct stimulant to the mucous membrane, in the same way that acids given before meals correct or prevent the excessive secretion of acid juice.

Potassa Sulphurata possesses the properties of the sulphur compounds in a more marked degree than those of the potassium salts, and will be referred to under Sulphur.

Potassii Acetas, Citras, and Tartras—These salts, in moderate doses (about 30 grs.) enter the blood speedily. They circulate along with it, acting as restoratives to the corpuscular elements and muscles and the various tissues containing potassium salts; reaching the kidneys the excess is excreted in the urine. Before passing out of the body the salts of potassium with vegetable acids, are converted into carbonates or bicarbonates, increasing the alkalinity of the blood and rendering alkaline the acid urine. The alkalinity of the urine results even if the salts contain an excess of acid, and occurs, though slightly, after the use of the acid tartrate; and since they possess no local corrosive action, but may be taken in doses ten to twenty times larger than is necessary to produce their diuretic effect, they may be administered freely. Though the reaction of the urine is thus altered from acid to alkaline, still its *total* quantity of acids in a state of combination may be augmented.

In this way the urine may be kept alkaline for many weeks, and during that time small uric acid stones in the kidney may be dissolved or so reduced in size that they may pass down the ureter and be expelled through the urethra. In health they often fail to increase the amount of urine.

In large doses, the tartrate, citrate, and acetate of potassium act as purgatives, from $\frac{1}{4}$ to $\frac{1}{2}$ oz. in solution being generally enough to cause mild catharsis. They are diaphoretic and febrifuge, opening up the cutaneous circulation by causing dilatation of the superficial capillaries, and the resulting perspiration affords one way for the extraction of heat from the body. It is, however, probable that at the same time they cause such alterations, either in the density or composition of the blood, as prevent or retard the changes taking place in that fluid upon which the increased temperature of the body may depend.

In *acute rheumatism* these salts are found beneficial; by increasing the alkalinity of the blood they counteract the effects of the rheumatic poison, and thus reduce the body heat and assist

in the cure of the disease. Their antacid properties do not, however, account for all the good they do in acute rheumatism, for they probably exercise a *sedative* influence over the nervous system, though it is by no means clear that they materially shorten the length of the attack. (See Potassii Bicarbonas.) Recently, as good results appear to have been obtained by the purely acid (acetic) treatment of this disease.

The *acetate* of potassium is the most certain diuretic of the vegetable potassium salts; the *citrate* is the most reliable diaphoretic; whilst the *acid tartrate* possesses the most pronounced cathartic properties. The citrate is more commonly ordered than any other potassium compound, since it is this salt which is formed when the carbonate or bicarbonate is administered in effervescence with lemon juice. In this form the citrate is an elegant gastric sedative, and it is beneficial in irritable conditions of this organ; with the addition of a little morphine no combination gives such relief in *phthisis* when the skin is hot and dry, the cough harrassing, and the tongue furred. The good effect in such cases is to some extent owing to the carbonic acid gas coming in contact with the peripheral nerves of the irritated mucous membrane. These salts of potassium (especially the citrate) have been highly recommended as restoratives in *scurvy* by those who believe that the disease is caused by a deficiency of potassium in the system.

It is the *citrate* which should always be selected when we wish to act upon the urine and keep it alkaline for any considerable length of time, because this salt has the slightest destructive action upon the blood and is the least likely to derange the digestion by its prolonged administration.

℞. *Potassii Acetatis* ℥iss.
 Liq. Ammon. Acet. ℥ij.
 Syrupi Aurantii ℥ss.
 Aq. Camphoræ ad ℥viiij. *misce.*

Fiat mistura, cujus capiat cochlearia duo ampla quartis horis.

The *acid tartrate* may be given with sliced lemon in hot water, sweetened with a little sugar. Its purgative power is increased if it be administered in less water than will dissolve it; and there are few more agreeable laxatives than a paste made of cream of tartar and orange marmalade. The mildness of its operation recommends its use in the reflex constipation caused by painful *hæmorrhoids*, in which case it may be combined

with sulphur, as in the official confection, or it may be given with marmalade.

R. *Potassii Bitart.* ℥j.
 Conservæ Aurantii (Keiller) ℥iv.
 Sulphuris Præcip. ℥ss. *misce.*

Fiat electuarium, cujus capiat cochleare magnum omni mane nocteque.

Potassii Carbonas resembles in action the liquor potassæ. It is corrosive to some extent, and a large dose causes death by destroying the tissues with which it comes in contact, though its effects are not so severe as are those following caustic potash or the liquor. It is seldom given in medicine, the bicarbonate possessing all its virtues without its irritative qualities. It readily enters the blood, in which it remains as carbonate; and it passes through the body, being eliminated unaltered, and appearing as carbonate in the urine, which it renders alkaline. It is diuretic, antacid, and antilithic.

Externally (4 grs. to 1 oz.) it checks the acrid secretion of *weeping eczemas* and the *itching of urticaria* and other skin affections. $\frac{1}{2}$ oz. added to each gallon of water in a hot bath is a very good way to relieve *general urticaria* of the body.

Potassii Bicarbonas—This salt possesses all the virtues of the potassium compounds, without any local corrosive or irritative action. It is a mild antacid; given in small doses, it stimulates the secretion of the gastric juice before taking food, and thus is beneficial in *atonic dyspepsia*. In *painful gastric affections* accompanied by excessive secretion of acid and acrid fluid after meals, if administered in large doses it counteracts acidity, and often gives instant relief, though its continued administration in such cases is not productive of permanent benefit. In *gastralgia*, not evidently depending upon excess of acid secretion, the bicarbonate relieves by its local soothing or sedative action, possibly by giving off carbonic acid gas as it comes in contact with acids.

It makes the blood more alkaline, and is excreted as carbonate by the kidneys, which it stimulates. Passing over the mucous membrane of the genito-urinary tract, it either exercises its direct sedative influence, or else, by rendering the urine less irritating it soothes the inflamed surfaces in *cystitis*, *gonorrhœa*, *pyelitis*, &c. It may well be combined in such cases with buchu, pareira, or hyoscyamus. If the urine be already alkaline and decomposing, causing irritation by the rapid formation of ammoniacal compounds in the bladder, the potassium salts may do harm if persisted in. If the irritation be caused by the presence of an

abnormal amount of uric acid, then the bicarbonate gives speedy relief.

Good results may be obtained by the injection into the bladder of *alkaline* solutions with the intention of dissolving small *uric acid calculi*.

There is much difference of opinion about the value of alkalies in *acute rheumatism*; but though it is unproven that this treatment possesses the power of cutting short the disease, still it is a well-recognised fact that the alkalies afford marked relief in this affection. It is possible that the beneficial effects of the drug do not depend upon its neutralising the supposed excess of acid in acute rheumatism, but from its so altering the composition of the blood that the changes in this fluid, caused by the rheumatic poison, are less easily effected.

In *rheumatoid arthritis* and *chronic rheumatism* benefit is found from the free administration of the bicarbonate if combined with the iodide of potassium.

It should be remembered that the alkalies, when given for a long time in medicinal doses, cause deterioration in the quality of the blood and diminish the weight of the body; and thus a tardy convalescence may result after the disease, for which they are administered, is cured.

The best form in which to give the bicarbonate of potassium is effervescing with lemon juice, one table-spoonful of which will be found to neutralise 25–30 grs. of this salt; but the alkali may be in any excess that the physician considers his case demands. See R. on-page 328.

A solution of citric acid may be used as a substitute for fresh lemon juice when the fruit cannot be obtained, but the natural juice is always to be preferred.

Potassii Bichromas is introduced into the B.P. to make chromic acid and valerianate of sodium, and it formerly was used for its supposed alterative action in *syphilis*. A saturated solution is employed as a caustic, brushed over *superficial growths*, especially of a syphilitic character. $\frac{1}{8}$ gr. would be an average dose of this drug; two or three grains will act as an emetic. Richardson has again drawn attention to a peculiar ulceration of the hands, face, and septum nasi which attacks persons working with this drug. The ulceration does not come on unless there has been a previous abrasion.

Potassii Bromidum and Iodidum. (See under Bromum and Iodum).

Potassii Chloras passes unaltered through the body without parting with its oxygen; and some authorities have been led erroneously to state that it produces no appreciable effect in the system after its admission into the blood.

A *small* amount *may* be changed in the system, and, although Mering has stated that "this salt, under the influence of carbonic and other acids, is decomposed in the system with the liberation of chloric acid, which tends to reduce the alkalinity of the blood, and in this lies the key to the action of chlorate of potassium," this has been amply disproved.

In moderately large doses (20 grs.) it stimulates the kidneys as it is excreted by them, and a portion appears in the urine; it seems to act powerfully upon the kidneys if administered during pregnancy. In poisonous doses (1 oz.) it causes active congestion of these organs, with bloody and finally suppressed urine.

It is, however, for its influence over *unhealthy mucous surfaces* that this remedy will always keep a high place in therapeutics. This effect is witnessed when a solution is applied to the *spongy gums* in various *aphthous conditions* of the mouth and throat, and in active *inflammations* of the *tonsils* and mucous lining of the *pharynx* and *nares*. A rational explanation of its action in these cases has yet to be given, and we must fall back upon such a term as "alterative" to explain its beneficial effects, for it seems by its local influence to alter in some way the unhealthy action of the membrane. One effect may be constantly observed when chlorate of potassium is used as a gargle in *follicular pharyngitis* or *acute tonsillitis*. Marked benefit at first follows its use, but if it is persevered in for any length of time, it keeps up a chronic irritation, which subsides only after its use is withdrawn. It appears to have an influence over the salivary and buccal glands, like what it has been observed to exercise over the mammary—viz.: it checks or moderates their secretion if excessive, and stimulates or increases it if scanty. It has been highly spoken of in excessive salivation from the injurious use of *mercury*.

After its absorption and entrance into the blood it appears to exercise the same alterative, stimulating, or regulating power over other mucous surfaces, especially the intestinal. In diseases of *childhood*, depending upon *catarrhal* and other *unhealthy inflammations* of the *mucous membrane* of the *alimentary canal*, from the mouth to the anus, the writer has found this drug invaluable. It is an expectorant in *bronchitis*.

In *scrofula* and various states depending upon a depraved or impoverished condition of the blood, chlorate of potassium has been highly spoken of, though it appears possible that many of its good effects in these cases may depend upon the iron which is so constantly prescribed along with it.

A solution of about 6 grs. to each fluid ounce of distilled water is a satisfactory application to *unhealthy sores and ulcers*, and may be used for washing out foul *sinuses* or *cavities*,

and will be found a valuable stimulant in various chronic affections of the *bladder*, if injected twice a day. The powdered salt may be applied to *aphthous* spots on the *cheeks*, *tongue*, or *gums*, and has been found to alter the action, diminish the pain, and check the growth of *epithelial cancers*. Small pieces sucked in the mouth, by reflex action, excite effectually the secretion of healthy mucus in chronic *bronchial* and *laryngeal affections*, so that the expectoration is rendered more fluid or less adhesive, and is readily swept up by the cilia; hence this salt is classed as a ciliary excitant.

Dr. Harkin has pointed out its usefulness in *purpura hæmorrhagica*, *epistaxis*, *hæmaturia*, and a host of blood ailments. By some unpublished experiments on milking cows, he has proved that it materially increases the quantity of milk.

Recent experience is showing that chlorate of potassium is not so inert as has been supposed; already many cases of poisoning have occurred on the Continent, and some from taking doses under 1 oz.; and Professor Bohn suggests the possibility of the chlorate being the cause of death in some diseases in which it is administered as a remedy, and he gives two instances of death in diphtheria, closely resembling chlorate of potassium poisoning, the salt having been previously freely given.

In acute poisoning death may take place in a few hours, from the hæmoglobin of the blood being converted into methæmoglobin, producing a chocolate colouration; there is vomiting, diarrhoea, dyspnoea, and cardiac depression.

Coghill believes that the action of the drug is *Catalytic*, i.e., by its presence and mere contact it has the power *per se* of oxygenating the blood. Dr. Henderson gives a graphic description of the power of the drug in speedily relieving the great suffering caused by breathing the thin air of very high altitudes in the lofty passes of the Himalayas. Though there is a feeling against the use of the drug in *diphtheria*, Lichtermann recently published an extraordinary report of his successes with it in several epidemics.

The following is a useful combination :—

℞. *Potassii Chloratis* ℥j.
 Tincturæ Ferri Perchlor. ℥ss.
 Glycerini ℥iss.
 Aquæ Destill. ℥xviii. *misce.*

Fiat mistura, cujus cpt. cochlearia duo ampla ter quotidie ex cyatho aquæ.

Potassii Cyanidum—This active poison is only introduced into the new B.P. for its employment in the purification of bismuth. It resembles hydrocyanic acid in its action.

Potassii Nitras—The salts of potassium, with the mineral acids, differ from the vegetable acid salts of potassium in passing through the system and being eliminated unchanged in the urine, whilst the latter are converted into carbonates.

The nitrate is a very active substance; it rapidly enters the blood, and in large doses prevents its coagulability by its action on the fibrin. It so alters the red blood corpuscles that they soon cease to possess any power of carrying oxygen to the tissues. The first effect upon the heart is to render it slower in its movements; afterwards it becomes quick and weak, and finally stops. Death may result from the violent irritant action of the salt on the alimentary canal, giving rise to severe vomiting and purging.

The salt is eliminated by the kidneys, during its passage through which it acts as a stimulating diuretic, appearing in the urine as nitrate. The skin is acted upon, this salt possessing very constant diaphoretic powers, which are increased if it be administered in some hot fluid at bed-time. A glass of whiskey or brandy, with boiling water and sugar and half a dr. of the nitrate, affords a good chance of getting the hot skin to secrete abundant moisture in *febrile affections*, whilst it slightly reduces the pulse, and the temperature falls a little.

This refrigerant action of nitre is generally explained by its sedative influence on the circulation and its effect upon the skin. It is a favourite diaphoretic and diuretic in all *inflammatory affections*, except where the gastro-intestinal or renal apparatus is involved. It is, probably, partially excreted by the bronchial mucous membrane, over which it appears to exercise an influence not unlike that which it effects on the skin, and it is a reliable expectorant when the irritation or inflammation is confined to the *trachea* or *larger divisions* of the *respiratory tract*. Bibulous paper soaked in a strong solution of nitre, dried, and allowed to burn slowly in the patient's room, has long been a favourite remedy in *asthma*.

The nitrate may be given with great advantage in a mixture of the citrate or bicarbonate in effervescence.

Potassii Permanganas is a powerful oxidiser, readily parting with its oxygen, which, on being freed, forms harmless compounds with foul-smelling gases and liquids, thus acting as a very efficient deodoriser. In a similar way it destroys the germs of disease, and thus is a disinfectant. It makes an elegant and not unpleasant gargle in fetid *ulcerations* about the *gums*, *mouth*, or *throat*, in the proportion of about 2 grs. of the salt in 10 oz. of distilled water. This weak solution may be also used as a lotion

to *suppurating sores*, or as an injection into *suppurating cavities* and *sinuses*, as in *ozæna* and *empyema*, or as an injection in *cancer* of the *os uteri*. 1 gr. to 2 oz. water makes a most valuable application to *burns*, *scalds*, and *frost bites*. It should be prescribed with distilled water, and kept in stoppered bottles; or given in the form of pill (page 52) as it so readily parts with its oxygen. It is probably entirely decomposed in the stomach before absorption.

The writer has found better results from an injection of this salt ($\frac{1}{2}$ gr. to 1 oz.) in *gonorrhœa* than from any other local remedy. It is very valuable (1 gr. to 1 oz.) in *gleet*.

It has been given in grain doses in *diabetes*, and has been very highly extolled as a specific in *amenorrhœa* or *scanty menstruation*, given in 2 gr. pills; the writer has not been successful with it.

It has been used to counteract the poison of *snake-bites*, and F. E. M'Farland has recommended it strongly in *cholera*.

Potassii Prussias Flava is only employed to make hydrocyanic acid.

Potassii Sulphas is used to effect the minute sub-division of the particles of powders and pill masses. It is a mild cathartic, acting by increasing the intestinal glandular secretion; and is especially suitable for children. The experiments of Rutherford prove that it is a decided hepatic stimulant.

Prunum—The dried plum is seldom employed as a medicine, but it is freely used in domestic life as a food and sweetmeat. It possesses faint laxative properties, and when stewed makes a tempting dish for constipated children. It probably acts by increasing peristaltic action.

Pterocarpi Lignum has faint astringent properties, probably depending upon traces of tannic acid which it contains. It is used solely as a colouring agent in the compound tincture of lavender.

Pyrethri Radix, when chewed in the mouth, acts as a powerful stimulant to the salivary glands, causing a sudden increase in the quantity of saliva by its direct irritant action. It has been thus used to relieve the pain of *carious teeth*, and as a masticatory in *paralysis* of the *tongue* and relaxation of the *uvula*. Its pain-relieving properties are very uncertain, though the tingling and unpleasant sensation which it causes in the mouth will always to some extent mask pain; and it appears to blunt the sensibility of the nerves distributed to the lining membrane of the mouth. Internally, it has been given in *globus hystericus* by Roth, who reports very favourably of it. He believes it acts by stimulating the sympathetic.

The writer has employed it with success as a rapid method of having *iodide of potassium* eliminated from the system in chronic poisoning by that drug.

The tincture may be used as a *mouth-wash* in the proportion of a tea-spoonful to a wine-glassful of water; or it may be applied in its undiluted state on cotton wool to the cavity of the diseased and painful tooth.

Pyroxylin is only employed in making Collodion.

Quassia is a pure bitter tonic, devoid of astringency; it is used in *dyspepsia* and *anorexia*. It closely resembles calumba (which see), and, like it, may be given with the preparations of iron, since it contains no tannin.

It possesses toxic properties when eaten by flies and fish, and has been supposed to act in a similar way in various diseased conditions of the blood, destroying unhealthy organisms, and acting as a true febrifuge, like quinine, but only very doubtful success has resulted when thus administered, possibly because too small a dose has been used. Brunton surmises that the bitters produce their tonic effects through their action on the liver. When injected into the rectum a strong infusion will cause the death of the *thread worm*.

R. *Infus. Quassiae* ℥xj.
 Tinct. Quassiae ℥vj.
 Tr. Ferri Perchloridi ℥ij. *misc.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die.

Quercus Cortex—Oak bark is a valuable astringent, owing to the amount of tannic acid which it contains, and it may be given internally wherever an astringent is indicated, though it is generally used as an external application. The decoction makes a useful, though not a very elegant *gargle* in *relaxed sore throat* and *spongy gums*; or a *lotion* to *flabby ulcers* and *profusely suppurating wounds*; or an *injection* in *gonorrhœa*, *leucorrhœa*, and *prolapsus ani*.

In passive *diarrhœa* half a wine-glassful may be taken after each loose motion.

R. *Alum. Sulph.* ℥iij.
 Decocti Quercus ℥xij. *misc.*

Capt. cochleare amplum ter in die.

Quinine. (See under *Cinchona*.)

Resina is not administered internally; it is used solely for its adhesive property and for making various fatty mixtures of suitable consistence for ointments. It has, however, feeble stimulating qualities, and is much used when made into an ointment with wax, lard, and oil as a mild stimulant to *sluggish ulcers* and *slowly healing wounds*; it appears to act in such cases by causing enough irritation to slightly increase the blood supply; at the same time it protects the ulcerated or wounded surface from the action of the atmosphere. (See also under Rosinol.)

Rhamni Frangulæ Cortex when freshly collected is a powerful irritant to the gastric and intestinal membranes, producing violent vomiting and purging, and may cause death. After being kept for a year or more its action is much milder, and it becomes a valuable aperient, acting very much like its ally—*Cascara Sagrada*—which see. It is useful in *chronic constipation*, and as a mild purgative where *hæmorrhoids* are present. It may be used exactly as *Cascara*, and its dose will not require to be increased as is the case with other purgatives. One dr. of the liquid extract may be given twice a day. It is very suitable for children.

Rhamni Purshiani Cortex. (See *Cascara Sagrada Bark*).

Rhatania (or *Krameria*—which see, page 427).

Rhei Radix—Rhubarb when administered in small doses (2 to 5 grs.) acts as a stomachic, increasing the quantity of the gastric juice, improving the appetite, and assisting digestion, and the tincture has been long used as a tonic. It soon finds its way into the blood, and, acting as a stimulant to the liver, or to that portion of it whose duty it is to secrete bile, it increases the quantity of this fluid without diminishing any of its ingredients. The cholagogue action of rhubarb is independent of any cathartic effects, as the results of experiments prove that the amount of the bile can be markedly increased in fasting animals without the bowels being disturbed.

In large doses (20 grs.) its cathartic properties are rendered apparent, and it produces mild purgation, probably by stimulating the muscular movements of the intestinal tube from the duodenum to the rectum. It also acts, though to a small extent, as a mild stimulant to the intestinal glands, and slightly increases their secretion. In doses of 60 grs. the intestinal fluids are considerably augmented.

Rhubarb after exercising its cathartic power becomes an astringent, and checks the alimentary secretions, causing subsequent constipation, owing to the rheo-tannic acid which it contains, and consequently it is not an advisable purgative for patients suffering under chronic constipation.

This renders it highly valuable in *diarrhœa* when we wish to produce an astringent effect after getting rid of some irritating food or matters remaining in the canal.

In *hæmorrhoids* few remedies will be found so useful as rhubarb, and some consider it much more efficacious if slowly chewed in the mouth; but in any case its only disadvantage is its astringency, which is entirely counteracted by two to four dr. doses of olive oil taken every night, floating on a little milk.

The stools are at first darkened, owing to the increased bile, and colouring matter of the rhubarb; they afterwards become pale. The colouring matter consists of chrysophanic acid, and is found in the perspiration, milk, and urine, but chiefly in the latter. Hence the administration of the drug has been recommended in *psoriasis*.

An equal quantity of bicarbonate of sodium is said to overcome the astringent properties of rhubarb and disguise its taste; and it may be so ordered as a powder in tea-spoonful doses in water.

It should be ordered with some substance like magnesia, as in the celebrated Gregory's Powder or Pulv. Rhei Co., which may be given in milk, and is an invaluable cathartic in the various *gastric* and *abdominal* troubles of *childhood*. The syrup is well suited for children, the coriander partially concealing the flavour.

The following form will be found a good one for producing the stomachic effects of rhubarb, though some prefer to substitute peppermint for the essence of aniseed; or the official compound powder may be given in a mixture—half an ounce rubbed up with nine and a half ounces of Aqua Menthæ Viridis and half an ounce of Spiritus Ammoniæ Aromaticus.

R. *Pulv. Rhei* ℥iss.
 Syrupi Simp. ℥j.
 Spt. Chloroformi ℥iiij.
 Ess. Anisi ℥. xx.
 Aquæ Carui ℥viss. *misce.*

Fiat mistura. Signa, "A small table-spoonful as a tonic or stomachic, or a wine-glassful as a purgative."

If a combination of rhubarb with an active cathartic is required, the official pill in 10 gr. doses will be found to answer all purposes.

Rhæados Petala possess very feeble narcotic qualities. Though it is impossible to get any traces of morphine when submitted to chemical examination, still the characteristic effects

of opium have been noticed when the syrup has been given to very *young children* or *infants*. Nevertheless, it is only for its colouring properties that it is used.

Ricini Oleum is a mild cathartic, by some authorities classed as a laxative. If rubbed into the skin of the abdomen in presence of a heat above that of the body, or if injected into a vein, swallowed, or thrown into the rectum, castor oil produces the same effect upon the intestines. The intestinal glands are slightly stimulated, and the vermicular contractions are increased in frequency and power, especially in the duodenal part of the canal, the result of which is, that in about six hours several very soft but not watery stools are passed with little pain and no constitutional disturbance. The oil passes out by the bowel; it may be recognised in the secretion of the mammary gland by its purgative effects upon the infant. Various unsuccessful attempts have been made to isolate the active principles of castor oil. It has been long known that the seeds are poisonous, and Dixon has isolated an active glucoside from the seed cake which Bubnow had erroneously supposed to be the active principle of the oil. It produces death without purging. The poisonous seed cake Dixon suggests could be used as food after boiling, which renders it harmless. Stillmark has isolated a very active ferment, which he calls Ricin, from the seeds.

The oil possesses no power over the hepatic secretion, and appears to lose its influence after a time; and in some cases its administration seems to be followed, like rhubarb, by an astringent effect. In *pregnancy*, where it is a very safe purgative, large doses may be required if regularly and constantly employed; and it is strange that sometimes in these cases if the large dose (1 oz.) be withheld, and only one or two tea-spoonfuls given, the drug appears to regain its power, and to purge freely; it has also nutritive virtues.


Its bland qualities render it a favourite and safe purgative for *young children* and *infants*, and in cases of *pelvic disease*. In the *diarrhœa* of infancy it is a prized medicine, acting by safely causing the expulsion of all irritating matters.

In *fæcal accumulations* castor oil has long held a high reputation; but too great stress cannot be laid upon the rule, that it should not be depended upon without the aid of enemata of large quantities of warm water. Accumulations of the rinds of fruits (especially of gooseberries), so often found in children, are not advantageously expelled by castor oil, as is supposed. More energetic cathartics are required, and calomel is especially useful in such cases.

A drop of castor oil allowed to fall upon the *conjunctiva* is a soothing protective when a foreign body has found its way under the lids.

The 'unpleasant' flavour and sickening, greasy taste of castor oil is a great hindrance to its use. If ordered alone, it may be administered when it reaches the sick chamber by floating it upon a little wine or spirit in a glass, after which it should be bolted quickly; some patients take it in orange juice, coffee, water, or gruel.

Directions are frequently given to float the dose between different strata of liquids. This is not practicable. Perhaps the best of all methods is to pour some *thick* cream into a very clean wine-glass, turn it round, so that the sides get smeared well over, pour in a table-spoonful of castor oil, and a little cream on the top. The patient, having taken a tea-spoonful of cream into his mouth and caused it to come into contact with his palate by the movement of his tongue, is directed to swallow at a gulp, the oil and cream out of the wine-glass, throwing back his head, that they may more readily pass over the tongue. Castor oil should be *gently* warmed before being administered, as it is rendered thus more liquid and less adhesive. The essential oil of bitter almonds conceals the nauseous smell of this oil.

 When the oil is administered very early in the morning (4 to 5 a.m.), the secretions of the mouth are so dried up that often the taste of the plain oil cannot be recognised.

If a castor-oil draught is ordered by the physician, he should endeavour to make it of as small bulk as is possible. The B.P. Mixture is a bad one.

A favourite combination is a half-ounce dose of castor oil with 10 to 20 minims of tincture of opium to prevent griping.

Children bear large doses well, and a small tea-spoonful is often administered to newly-born infants without producing unpleasant effects. As a rule, never more than half an ounce should be administered for the first time to an adult.

One or two ounces, with as much mucilage of starch, may be injected into the rectum.

Rosæ Caninæ Fructus—The confection—is only used as a basis for pill masses and electuaries. It is useful for working up insoluble powders, especially of vegetable origin, into the pilular form, but the free malic acid which it contains is liable to decompose metallic salts, and it increases the bulk of the pill to a very undesirable extent.

Rosæ Centifoliæ Petala are only used in the form of otto, or rose water, for the sake of their delicious perfume. The water may be used as the basis of eye-washes and lotions, where its fragrance renders it particularly acceptable.

Rosæ Gallicæ Petala—The petals of the red-rose possess astringent properties if collected before their expansion, as the

Pharmacopœia directs. Their astringency depends upon the small quantities of tannic and gallic acids contained in them, and is not so very decided as to warrant the use of the drug in the presence of so many valuable official tannates.

The infusion made with dilute sulphuric acid and water is an elegant method of administering the mineral acid, and may be made the basis of many agreeable mixtures. Its activity depends upon the tonic and astringent properties of sulphuric acid, and it may be freely given in the *hæmoptysis* and *sweating* of *phthisis*, and as a gargle in *relaxed sore throat*. The dilute nitric acid may be substituted for the sulphuric with advantage in suitable cases as pointed out by Squire.

The confection of the red-rose is used like the corresponding preparation of hips—to form the basis of pill masses and cough linctures. The syrup is never employed except for its colour.

Rosmarini Oleum is a powerful stimulant when taken internally (which is seldom) ; it acts like peppermint.

Externally, it is a valuable rubefacient, and is much used as an application to the *scalp* in *baldness*, where it is commonly supposed to improve the nutrition of the hair-bulbs, by increasing the supply of blood to the skin. Its efficacy is greatly increased by combining it with cantharides. It is often added to liniments on account of its odour.

The following is a valuable remedy for *baldness* :—

Rx. *Olei Rosmarini* ℥iv.
 Liq. Epispastici ℥ii.
 Olei Amygdal. Dulc. ℥iss.
 Spt. Camphoræ ℥ii.
 Glycerini Boracis ℥j.
 Otto de Rose gt. viij.
 Tinct. Jaborandi ℥i. *misce.*

Signa. “A little to be rubbed into the roots of the hair every night.”

Rutæ Oleum is a strong rubefacient, and if applied to the skin with friction it will often cause vesication.

Internally, rue is not often administered ; it acts as a powerful stimulant like rosemary, peppermint, and cajuput, and is occasionally used for its antispasmodic powers to relieve *colic* in 2 to 5 minim doses on sugar, or in a spoonful of whiskey, or in pill. It may be given in *hysterical ailments*, *epilepsy*, &c.

Rue excites the contractions of the uterus, and has been employed to *produce abortion*, and has caused death, preceded by symptoms of narcotic and irritant poisoning.

Sabadilla and Veratrine, its alkaloid, are violent irritant poisons, producing vomiting and purging, with intense abdominal pain, convulsions, extreme muscular prostration, and great cardiac weakness and collapse, with a prickling sensation felt in the skin of the body. It exerts its action chiefly upon the *muscles*, by producing *prolonged contraction*, which Brunton has found is removed by extremes of heat and cold. The sensory and motor nerve endings, at first stimulated, become paralysed, and the heart muscle, after slow and prolonged contraction, is arrested in systole, the pulse and blood pressure, having at first become increased, then fall markedly. The respirations, at first quickened by small doses, become slowed by large ones, and finally paralysis of the vagus and respiratory centre takes place.

Veratrine, applied to the skin, paralyses the filaments of the sensory nerves, acting as a local anæsthetic, and hence has been used as an application in the form of the official ointment to various *neuralgic nerves*. The best results have followed its use in the case of the fifth nerve, and it has been found useful in *severe sciatica* and *sick headache*, when rubbed over the affected or tender nerves. Its use is generally followed by some local irritation in the skin. When it comes in contact with the nasal mucous membrane it acts as a sternutatory and an errhine.

Veratrum viride, or green hellebore root, should not be confounded by the student with veratrine, the alkaloid of sabadilla, though sabadilla and green hellebore and their alkaloids resemble each other very closely.

Veratrine is only used externally; when its internal effect is required the green hellebore root tincture is used. In large doses this acts as a powerful drastic purgative, causing watery, painful, and bloody motions, resembling colchicum in some of its effects, whilst its influence over the heart has been likened to that of aconite. The pupil dilates, and the pulse under its use may fall to half its number, and is very much weakened in force. The muscles, at first rendered more irritable, become greatly prostrated, and voluntary movement is difficult, evidently from the prolonged muscular contraction, and paralysis of the nerve endings. The body heat in health is scarcely affected; but in *febrile conditions* hellebore undoubtedly reduces the temperature, though not to the extent believed by some of its advocates. It has been used in the treatment of *fevers*, *acute rheumatism*, *gout*, *local inflammation*, *acute pleuritis*, &c.; but the most promising results have followed its use in *acute pneumonia* and *mania*. It

should be administered in small doses (2 mins.) every hour, and its effects closely watched.

Its dangerous depressant effect on the heart, and its irritant action on the alimentary canal, prevent its general use.

Veratrine, green hellebore, and sabadilla may be employed in powder or ointment to cause the destruction of *pediculi*.

Sabinæ Cacumina—Savin is used externally as a rubefacient, and the oil, if applied for a sufficiently long time, will produce vesication. The official ointment is used as a dressing for *blistered surfaces* which are required to be kept discharging. The dried powder has been dusted over *indolent sores*, and applied to *warty growths*.

Internally, the oil is the best form for administration. It rapidly enters the blood, from which it is excreted by the skin, lungs, and kidneys, the secretions of which organs it markedly increases, especially that of the kidneys, and occasionally its diuretic action is carried too far, causing bloody urine and strangury. The heart is somewhat stimulated by full doses, and the uterus is powerfully excited by large doses. This latter effect of savin is constant and marked, and it produces better results than most emmenagogues.

To cause *abortion* (for which object this drug has been criminally administered), savin must be given in dangerous doses, in which case it acts as a violent irritant poison, producing vomiting, purging, collapse, and even death.

In *amenorrhœa* 3 minim doses of the oil may be found to establish the *menstrual flow*, after the ineffectual use of iron and ergot. Some have recommended the same treatment in *menorrhagia* depending upon a relaxed condition of the uterus. *Subinvolution* may be benefited by it.

Saccharum—Sugar as a food possesses well-known properties; it is a nutrient to the adipose tissue of the body and a respiratory fuel. It is used in Pharmacy for a variety of purposes, but the physician only orders it to sweeten mixtures or to assist by its density in the suspension of powders. The B.P. orders its addition to water to increase the solubility of lime, and to prevent changes in various unstable preparations.

Saccharum Lactis is used, owing to the hardness of its particles, to effect the minute sub-division of the particles of substances in powders or pills, and thereby to increase their efficacy and insure their equal distribution in each dose.

It resists fermentation, and is given instead of cane sugar to sweeten the food of *dyspeptic* infants; and for a similar reason it has been given in various *irritable conditions of the stomach*, and as a food in some *wasting pulmonary diseases*.

Recently this drug has been demonstrated to be a valuable diuretic, enormously increasing the flow of urine in *cardiac dropsy*. It acts as a diuretic in albuminuria, but not so markedly. There is great discrepancy in the doses employed by different observers; these range from 3 drachms to 3 ounces for a daily dose. It may be given in water or in milk.

Salicin.—(See under Acid. Salicylic., page 333.)

Sambuci Flores—The water distilled from the flowers does not possess any therapeutic value, though other parts of the plant are by no means inert, for the inner bark is cathartic and emetic. Combemale and Lémoiné have recently shown that valuable diuretic effects can be obtained from a decoction of the fresh inner bark; the dose is a handful of fresh inner bark daily, boiled in 40 oz. water. They report great success with it in *acute nephritis*. The water is used as the fragrant basis of lotions, and enjoys the popular reputation of a cosmetic, clearing the skin of marks caused by exposure to sunlight.

Santali Oleum closely resembles copaiba in its action, and is used in the treatment of *gonorrhœa* and *gleet*. It acts upon the lining membrane of the bladder and urethra as it is being excreted in the urine. Posner believes that it has a specific action upon the prostatic portion of the urethra.

Dr. Park believes that it acts also upon the pelvic and genital nervous systems, and it has been used in *renal colic*. It is a special stimulant to unstriated muscular fibre, and a good astringent to all mucous secretions, as *leucorrhœa*, *diarrhœa*, *bronchorrhœa*, &c. Da Costa has found great benefit from its use in *fetid bronchitis*.

If it does not act speedily in 20 minim doses on the gonorrhœal discharge, which it generally diminishes in 60 hours, the probabilities are it will not do much good, and another drug should then be tried, as the paste mentioned upon page 396. The administration of the santal oil should be kept up for some time after every trace of the gleet or gonorrhœa has disappeared. It may be ordered with mucilage in a mixture, each $\frac{1}{2}$ oz. of which can be made to contain 20 minims of the oil, with 1 dr. of syrup, 1 dr. mucilage, and 2 drs. infusion of orange peel. It may be given before, after, or with food.

Santonica, and Santoninum (its active principle), are used to cause the destruction of worms in the intestinal canal. Santonin is by far the best vermicide for the common round worms—(*ascarides lumbricoides*)—acting speedily and certainly when properly administered. It also kills the thread-worm, though it appears to have no effect upon the tape-worm.

It kills the worms in doses which do not produce purgation, though it purges if given in large doses, and may cause serious

cerebral symptoms. Death has followed the use of the drug in very young children or infants, in whom it sometimes produces convulsions, vertigo, and coma, with purging and vomiting.

Santonin, like many other remedies of its class, produces its effects more certainly if administered after fasting, or after the operation of a mild purge. In castor oil, as pointed out by Kuchenmeister, it acts more satisfactorily than when given in any other way, and the writer can strongly endorse the accuracy of this observation, after seeing its administration in some thousands of instances in the practice of a children's hospital. Unpleasant symptoms were never observed, though the drug was given in full doses; *the oil appears to lessen very considerably the risk of any evil effects.* To a child two years old 2 grs. may be given at bed-time, mixed with a large tea-spoonful of castor oil, and more oil or other purgative administered in the morning if necessary. The worm is generally expelled dead. Recently it has been stated that the drug acts by causing convulsive movement in the worms which excites the intestine to expel them.

Some curious effects are constantly observed to follow the use of santonin. Yellow vision is one of these, and may be noticed shortly after the dose is given—inside an hour; every object appears yellow or green to the patient, and violet objects are recognised with difficulty, though the humours or solid tissues of the eye are not in any way coloured. The effects appear to depend upon the action of santonin on the delicate retinal fibres. The retinal blood-vessels are always congested. Perversions or alterations in the smell and taste are also occasionally experienced. The urine is very often stained yellow, orange, or red, apparently varying in colour according to the degree of its alkalinity; and santonin acts as a diuretic, stimulating the kidneys, by which it is eliminated, and it also sometimes renders the bladder irritable. It is supposed to act in the blood in combination with soda. It has been tried unsuccessfully in *nocturnal incontinence of urine*, in *amaurosis*, and for *colour-blindness*. It has been said to remove the discharge in *gleet*, and to diminish slightly the albumen in *albuminuria*, Chéron lauds it in *dysmenorrhœa* and *amenorrhœa*.

When given to *young* animals santonin produces cataract. It may be given in the form of a lozenge or as a powder, with a little calomel, or in olive oil, to those who cannot bear the taste of castor oil; or it may be given in a suppository.

It may be dusted in fine powder over a slice of bread and butter, and is thus readily eaten by children.

(For a child 2 years old.)

R. *Pulv. Santonini* gr. ii.
 Pulv. Sacchar. Alb. gr. ii. *misce.*
H. S. S. *ex cochlear.* i. *parv.* Ol. *Ricini.*

For Santoninoxime the non-poisonous substitute for santonin, see the Non-Official Remedies.

Sapo Animalis, Durus, and Mollis—These substances are introduced into the B.P. with the intention of assisting, by their physical qualities, to hold different preparations together. Thus, curd or animal soap, enters into several suppositories, whilst hard soap is the excipient for seven pill masses, and soft soap enters largely into the liniment of turpentine.

Soap, however, possesses other valuable qualities. Thus, it is an antacid, and, acting like the alkalis, will counteract an excess of acid in the system, and this, too, in a way which cannot so readily be achieved by the soluble alkalis. It can be so easily given in the pilular form that we can manage to have its alkaline effect produced at that part of the canal which the more soluble alkalis generally do not reach. It probably acts as a restorative by supplying to the bile some salts which are natural constituents of that fluid. At the same time it may assist in the emulsifying process going on in the duodenum.

It has long since been pointed out by Paris that soap, added to purgatives like aloes and jalap, mitigates their acrimony, and at the same time quickens their operation; and this is frequently explained by pointing out the *solvent* power of soap over these bodies. Large doses of soap have been highly recommended as a solvent for *gall-stones*, and as a means of rendering the urine alkaline in cases of *renal calculi*, in both of which instances its use should be pushed.

It acts as a laxative when swallowed or introduced into the rectum, and this latter action of soap affords one of the most simple and convenient methods of emptying the lower bowel. In the case of infants, a thin, wedge-shaped piece of ordinary hard soap may be introduced through the anus for an inch or more, and held there for a few moments. By its irritation, reflex action is aroused, causing the contraction of the rectum and often of the entire colon. In adults, a small plug as large as the last joint of the index finger may be inserted like a suppository, and allowed to remain till expelled.

Externally, the cleansing properties of soap are well known; and it should be remembered that it often irritates *eczema* and prevents its cure, whilst sometimes, in sluggish cases, it may act as a healthy stimulant. By far the least irritating soap made is Pear's transparent preparation.

The liniment of soap is a valuable remedy in *sprains*, *bruises*, and *stiffness* of *joints* from inflammatory effusion; its action in such cases is called "discutient." It removes the swelling by stimulating the absorbents, and requires friction in its application. The plaster is supposed to act in the same way, but it probably

possesses no specific action beyond the support and pressure which it affords, at the same time giving the affected surface somewhat of the benefits of an internal part.

Sarsæ Radix — About this drug very different opinions prevail, some authorities condemning it as absolutely inert, while many surgeons firmly believe in its virtues as a diuretic, diaphoretic, and antisymphilitic. It is probable that the *fresh* root possesses properties which render it of value in the treatment of *secondary* and *tertiary syphilitic affections*, various *skin diseases*, &c.

The dried root produces no appreciable therapeutic effects. The compound decoction occasionally gives results worth its cost; but there are three ingredients contained in it which possess well recognised tonic and diaphoretic properties. Both decoctions make elegant bases for more active medicines, as perchloride of mercury and iodide of potassium.

Sassafras Radix is generally classed as a stimulant and diaphoretic; the oil produces the effects of a mild stimulant, acting upon the vascular and nervous systems.

The drug is often employed for its flavour, and it gives diaphoretic qualities to the compound decoction of sarsaparilla.

Scammonium and its resin resemble jalap very closely in their action. They are powerful hydragogue purgatives, producing their effects by their *local* irritative action on the bowel, causing in about four hours the evacuation of the contents of the colon in a semi-solid form, soon followed, with much griping, by liquid stools. Five grains of the resin, or ten of the gum-resin or scammony, are a fair dose for an adult; but this drug should be given in combination with some purgative which would assist its action and diminish the griping. The best way to achieve this object is to combine it with calomel.

It is indicated where the thorough evacuation of the contents of the bowel is desired, as in *impaction of fæces*, or where a quantity of serous fluid is required to be removed from the blood, as in *head injuries* and *dropsies*.

It appears to act more promptly when given with an alkali, and soap answers this purpose well; sulphate of potassium corrects its griping.

Though a powerful stimulant to the intestinal glands, it has but a very feeble effect upon the liver.

It is a favourite remedy in the *constipation of children*.

Scammony has been much used as a remedy for the various forms of *parasites* infesting the alimentary canal, especially of children. There is, however, no evidence to show that it acts

as a true Anthelmintic, since its beneficial results in such cases appear to be easily explained by its irritant purgative qualities.

℞. *Scammoniae Resinae* gr. x.
 Hydrarg. Subchloridi gr. vj. *misce*
Et divide in pulv. ii. st. i. statim.

Scilla—Squill is a violent irritant poison, causing death by its action upon the gastro-intestinal mucous membrane, giving rise to vomiting and purging and severe inflammation of the mucous tract. These effects are noticed in a more or less marked degree, whether the drug be swallowed, applied to the broken skin, injected into a vein or into a serous cavity, or under the skin. In its action it closely resembles digitalis, but it is more irritating to the stomach and bowels, and it has valuable expectorant powers which digitalis has not. It is excreted by three outlets—by the bowel, acting as a mild purgative; by the kidneys, which it stimulates, producing diuretic effects; and by the pulmonary mucous membrane, whose secretion it liquefies, thus acting as an expectorant. It is for this last effect that squill is ordered most frequently, and it may be well combined with ipecac. The syrup and the oxymel possess reliable expectorant powers in the *chronic bronchial affections of childhood and infancy*, in 10 minim doses. It is rarely used alone as a diuretic, but is generally given with digitalis or mercury. (See page 400).

Its use is indicated in *chronic catarrhal affections* with profuse tough expectoration, and in *dropsies*, in the absence of any inflammatory state of the stomach, bowel, or kidneys. It is especially useful in *cardiac dropsy*.

(As an Emetic for a Child one year old).

℞. *Syrupi Scillae*
 Vini Ipecac. ana ʒj. *misce.*

St. ʒi. omni semi-hora ad effectum.

20 drops may be given every 3 hours as an expectorant.

Scoparii Cacumina—Broom is a valuable and safe diuretic, resembling buchu and digitalis. In large doses it is an irritant to the gastro-intestinal mucous membrane, producing vomiting and purging, though only to a slight degree. It is given in cardiac and chronic renal dropsies, where no active inflammation of the kidney is present. Sparteine, the active principle of broom, has been recently found to possess properties of a cardiac

tonic nature, like digitalis. (See Sparteine in the Non-official Remedies).

℞. *Succi Scoparii* ad ℥iv.
Tinct. Digitalis ℥iv.
Spt. Ether. Nitrosi ℥vj. *misce.*

Fiat mistura, capiat ℥i. sextis horis.

Senegæ Radix is one of the most frequently used expectorants acting upon the bronchial mucous membrane, over which it exercises a stimulating influence. It is given in *chronic bronchitis* and *emphysema* when there is *profuse* adhesive discharge. Some authorities explain its effects as depending upon a stimulating action on the respiratory centre or efferent nerves, which causes continual coughing, thus keeping the tubes clear and preventing the accumulation of mucus. Farquharson believes that it acts as a tonic to the muscular tissue in the bronchial tubes, thereby facilitating the expulsion of their contents. Its action is greatly increased by carbonate of ammonium.

It causes a warm acrid sensation when chewed, and increases the salivary secretion; in large doses it is an emetic, and may cause purging. It does not increase the amount of urine in health, but, like digitalis, it augments it in diseased conditions of the kidneys or heart, or when there are accumulations of fluid in any of the serous cavities.

The tincture emulsifies fats and oils in quantities so small that its medicinal action may be left out of consideration; thus, five minims will emulsify half an ounce of fixed oil. This property may find some application in therapeutics, as the tincture administered after meals may assist the emulsification of the fats before they leave the stomach, and thereby probably hasten their absorption by the lacteal vessels.

The following is one of the most popular combinations for chronic bronchitis:—

℞. *Infusi Senegæ* ℥vii.
Tinct. Senegæ ℥ss.
Tinct. Camph. Co. ℥ss.
Ammon. Carb. ℥iss. *misce.*

Fiat mistura, capiat cochleare magnum quartis horis.

Senna is a valuable cathartic. Speedily entering the blood, it produces its effect upon the bowel, and it has been supposed to act in the same manner whether administered by the mouth

or injected into a vein. Stockman, however, injected poisonous doses without producing any results. The small intestines are stimulated by it, and both their secretion and movements are increased; it produces thin but not watery motions, generally accompanied by considerable griping pain. Senna when administered to nursing mothers appears in the milk, where, according to Dolan, "its peculiar flavour and odour are distinctly perceptible, though it does not lessen or increase the secretion of milk." It invariably gripes the infant.

Senna should be combined with aromatics to correct the griping, and the compound mixture is a valuable method of administering the sulphate of magnesium. Senna is said to be a chief ingredient in Tamar Indien, which is a valuable purgative.

It is a safe *purgative* for *children*; though causing pain, ill effects are rarely seen to follow large doses.

In *dyspepsia* and *obstinate constipation* the infusion in a wine-glassful dose, to which a table-spoonful of the tincture is added, makes a powerful purgative. It acts, according to the experiments of Rutherford, slightly as a stimulant to the liver.

The syrup is an elegant, though very uncertain purgative for young children, and it may be used as the vehicle for almost any medicine ordered as a powder. 2 grs. of grey powder given in a tea-spoonful of syrup of senna is a very palatable purgative and cholagogue.

The confection is a mild and safe laxative, suitable in most cases of *chronic constipation* when given in tea-spoonful doses.

The compound powder of liquorice owes its purgative virtues to senna, and is a safe, palatable, and efficient cathartic suitable for children and adults.

St. Germain's Tea, *i.e.*, 30 grs. Senna leaves, 15 grs. Elder flowers and Anise fruits, with 8 grs. Cream of Tartar and Fennel fruits, infused in a cup of boiling water, is an elegant and palatable method of giving senna.

Serpentariæ Rhizoma—Snake-root is a stimulating tonic, possessing feeble aromatic properties. Small doses increase the appetite and promote digestion by mildly *stimulating* the mucous membrane of the stomach. Large doses produce irritation in the stomach and bowel, as evidenced by nausea, diarrhœa, reflex headache, &c.

It is employed in *dyspepsia* arising from want of tone, or atrophy of the gastric tubules, and its supposed stimulating properties have obtained for it some repute in low febrile conditions, as in *typhus*, *typhoid*, *diphtheria*, and *rheumatism*.

Snake-root does not, as once believed, possess any value in the treatment of *rabies* or *snake-bites*, nor is there any evidence of its emmenagogue or diuretic properties, and it might well be omitted from the next edition of the B.P.

Sevum Præparatum—Suet is a well-known fat and a nutritious article of diet, but it is introduced into the Pharmacopœia solely for its physical qualities.

Sinapis—Mustard is rarely prescribed internally, except as an emetic in cases of poisoning, when a table-spoonful, stirred up in a tumblerful of warm water, may be administered, and warm water freely swallowed afterwards. As a condiment it is supposed to increase the appetite, though the gastric juice is not markedly increased by its local action.

Externally, mustard is the best counter-irritant for general purposes ; it differs from cantharides in the rapidity and amount of pain attending its action. When applied to the skin, mustard quickly causes a flow of blood to the vessels of the part, and if its application be continued too long, inflammation of the skin, vesication, or ulceration may follow.

The plaster is spread on a variety of fabrics, and covered with tissue paper, muslin, cambric, &c., but every requirement is met by the following rapid, cheap, and convenient plan :—

The required quantity of mustard is put into a large cup (about a table-spoonful of mustard makes a fair-sized sinapism) and as much *cold* water is poured upon it as will make a soft uniform cream, not quite so fluid as to flow or pour readily out. A sheet of paper is procured of such thickness as will readily permit the fluid part of the cream to soak through it, without becoming too easily torn. Old newspaper is the best texture for this purpose, and it should be laid out upon a table or smooth surface, the mustard cream turned out of the cup, and roughly smeared or spread over its centre. The circumferential or clean parts of the paper are folded over this, making the required shape and size of the sinapism, which is lifted off the table, and the surface which was undermost applied direct to the patient's skin. Less than a minute is enough (when the materials are at hand) to perform this little operation. If not made in the sick room it should be carried there on a dinner plate.

It will be observed that the mustard does not thus come in contact with the skin, but only its moisture, which soaks through, the paper being between the skin and the cream. The sinapism should be kept in contact with the patient's body by a bandage or pad of flannel for 15 to 30 minutes. In the case of children, the mustard before being moistened, should be mixed with from 1 to 4 parts of wheaten or corn flour to dilute it. Often the question is asked the young practitioner, How long should such an application be permitted to remain? This is difficult to answer, and he should direct that, after a few minutes the edge of the sinapism be raised and the redness of the skin noticed. If it remains scarlet for a few minutes the application should be

removed, but if the redness is only temporary the sinapism should be kept on longer.

A mistake is made in directing the surface to be immediately covered with cotton-wool, greased linen, &c. ; it should first be always wiped dry and clean with a very soft rag ; otherwise as much acrid moisture may be left on it as may produce vesication and dangerous ulceration in the delicate skin of an infant.

The mustard bath is a favourite method of applying counter-irritation—to the feet for *headache* ; to the abdomen for *amenorrhœa*, at the time of the expected period ; or to the loins in *suppression of urine*. About 2 oz. of powdered mustard seeds to 10 gallons of hot water (102°) will make an agreeable bath. In a similar way it may be used as a *hot pack* in *rheumatism*, &c. (See under Aqua.)

Pain of various kinds is relieved by the application of a sinapism ; but, as a rule, it is aggravated if it be placed directly over the pained nerve. It should, as a general rule, be applied over the site of its origin near the spine.

The action of mustard when placed over the seat of *internal inflammations*, or over the chest and legs in case of *stupor*, is to be explained on the theory of reflex action. It is easy to see that the impression produced by an irritant on the peripheral endings of any nerve may be conducted to the nerve centre or brain, and from thence may be reflected to any other part of the nervous system ; thus a sinapism on the chest may stimulate the respiratory or cardiac centres. (See under Cantharis.)

Sodium—The salts of sodium possess such close resemblance in their pharmaceutical, chemical, and therapeutical properties to those of potassium, that only a brief enumeration of them is necessary. Speaking generally, sodium salts differ in the following respects from the corresponding potassium compounds—(1) they are less caustic when used externally ; (2) they *exert scarcely any depressing influence over the heart*, and hence are not poisonous in the sense that potassium salts are ; (3) they are less diuretic ; (4) they form less soluble salts with uric acid ; (5) owing to the entire system being saturated with sodium, medicinal doses do not appreciably affect metabolism (Mitchell Bruce) ; and (6) they are much less diffusible.

Soda Caustica is seldom employed ; it is weaker than caustic potash. Mixed with an equal weight of recently burned lime, and made into a paste with alcohol, it is known as London paste, and is used as a caustic application to the *tonsils*. (See Potassa Caustica.)

Liquor Sodæ resembles the liquor potassæ, but is seldom used. It possesses little, if any, effect upon the kidneys or bladder, though it will render the urine alkaline after a time.

Soda Tartarata—Rochelle salt closely resembles the tartrate of potassium, though its diuretic powers, in $\frac{1}{2}$ to 1 oz. doses are so feeble that they are doubted by some. It is a very popular saline purgative, acting as a strong stimulant to the intestinal glands. Small doses have the power of rendering the urine alkaline like the potassium salts, though not so certainly.

Its cathartic action is most unreliable unless given in a full dose, so that it is a good rule to give at least six drs. Often four drs. will be administered and *no effect whatever* be noticed, while five or six drs. may purge freely. It should be given always in a large quantity of water when its cathartic effects are desired.

1 oz. Rochelle salt dissolved in a glassful of aerated lemonade or ginger ale makes a pleasant saline purgative; or it may be taken in the form of Seidlitz powder.

Sodæ Chlorinatæ Liquor—The hypochlorite of sodium contained in this liquor is readily decomposed when it comes in contact with the weak acid compounds of the body.

The hypochlorous acid, which is given off in contact with any acid, is a powerful oxidising agent, giving off its active oxygen, which greedily attacks most animal substances, whilst its chlorine enters into combination with the hydrogen of many bodies. This solution is a strong disinfectant and antiseptic. It is also regarded as a stimulant. These varied qualities render it of use in low *typhoid conditions* and *adynamic fevers*, especially in *diphtheria* and *malignant scarlatina*.

It should be given alone with water—1 scruple mixed with 1 oz. every two or four hours.

Externally, it is an invaluable remedy as a gargle in *putrid throat affections*, in which case it may be made of the same strength as for internal use. (See Calx Chlorinata.)

Sodii Arsenias—(See Acid. Arsenios.)—It contains so little sodium in each dose that it should be regarded as an arsenical preparation; 5 to 10 minims of the liquor may be given in infusion of calumba.

Sodii Benzoas is identical in action with Acid. Benzoic. (which see). It is used for its diuretic and antiseptic qualities in renal and bladder cases, being excreted as hippuric acid after uniting in the kidneys with glycocoll. It has been given in *diphtheria*, *phthisis*, *rheumatic fever*, *uræmia*, and *gout*.

Sodii Bicarbonas closely resembles the bicarbonate of potassium (which see). Like it, it is antacid, and though less irritating, it possesses greater saturating power. It has also a more soothing effect upon the stomach than the corresponding potassium salt, but it is very inferior to it as an antilithic, since the salts which it forms with uric acid are only slightly soluble.

This is seen in *gout* in the deposit which forms about the joints, which consists of urate of sodium. It does harm in cases where there are phosphatic sediments in the urine.

In the form of Vichy water the bicarbonate of sodium has been long in use as a remedy for many complaints supposed to be of *gouty* origin, and has been found to relieve *frontal headache*. The official effervescing solution when administered with milk is sometimes the only food retained by an irritable stomach. The lozenges are used in *dyspepsia* and *bronchial catarrhs*; in this latter condition their efficacy depends upon their probable action upon the cilia.

Externally, the bicarbonate of sodium has been found to possess an almost magical power when applied to painful *burns* and *scalds*. If used *immediately* after contact with great heat, what would otherwise be a painfully blistered spot is entirely relieved, and often in a few hours may be found to differ in no way from the healthy surrounding skin. It may be applied in solution of any strength, and the salt made into a paste with water and rapidly applied to the injured part generally produces surprising results, if vesication has not already occurred.

It is strongly recommended in *acute tonsillitis* as a gargle, or brushed over the swollen glands.

It is used in a variety of *cutaneous affections*, and 1 oz. in a pint of water, sponged over the itching skin in *urticaria* and other complaints, often gives relief; it may be combined in these cases with prussic acid. It relieves the pain of *wasp stings*, but is inferior to ammonia in this respect.

Sodii Bromidum acts like the bromide of potassium—(page 361)—only it is less irritating to the stomach and less depressing upon the heart.

Sodii Carbonas resembles the bicarbonate, but is more caustic and more soluble. It makes a very good effervescing mixture when given with lemon juice, superior, indeed, in its sedative effect upon the stomach to any other combination; and with it hydrocyanic acid can be given. The dried carbonate of sodium is the most convenient antacid to give in pill or powder; it is nearly three times stronger than the crystallised salt.

Rx. *Sodii Carbonatis* ℥vj.
 Acidi Hydrocyanici Dil. ℥. xxx.
 Aquæ Destillatæ ℥x. *misce.*

Fiat mistura, cujus cpt. ʒi. cum ʒss. succi limonis recentis tertiis horis.

The alkaline bath is made by dissolving 8 oz. of carbonate of sodium in a large bathful of water—say about 60 gallons.

Sodii Chloridum enters so largely into every tissue of the body that life cannot be sustained when it is withheld. It is absolutely necessary wherever cell growth is rapidly going on; animals would soon die without it (especially growing animals). Small doses are restorative and tonic; larger doses (1 to 2 oz.) are either slightly purgative or emetic.

It possesses expectorant qualities if given in 1 dr. doses—every two or four hours. It is excreted by the mucous membranes of the body. It is a certain antiseptic, and destroys the small thread worm, *ascaris vermicularis*, when administered by the rectum ($\frac{1}{2}$ oz. in 3 or 4 oz. of water).

1 lb. of salt and 3 gallons of water make a convenient substitute for sea-water. The brine baths of Droitwich owe their virtues chiefly to this soda salt; they are of great value in *chronic rheumatism and joint diseases*.

It is used sometimes (1 to 30) as a gargle in *chronic catarrhal throat affections*, and is a valuable antidote in cases of *poisoning with nitrate of silver*, or after swallowing a *leech*. Wyman applies the dried salt mixed with 3 times as much elm bark and a little hyoscyamus to the os uteri in *subinvolution*, and retains it in situ with cotton-wool. It depletes like glycerine.

Betz has used chloride of sodium in *internal hæmorrhages* with marked benefit. He dissolves a tea-spoonful in half a litre of water, and administers it by the mouth at the rate of 3 table-spoonfuls every five minutes. Since Nothnagel pointed out the good results of common salt in *epilepsy* various observers have reported cures. 1 dr. doses may be given. In a similar way *migraine* is sometimes relieved.

The *hypodermic* injection of an 8.75 per cent. solution of salt into the subcutaneous cellular tissue has been advised in *cholera*. Weak solutions (1 drachm to 1 pint) have been injected into the veins in *acute anæmia* from hæmorrhages of all kinds and in *diabetic coma*.

Sodii Citro-Tartras Effervescens—This agreeable antacid and purgative is the official representative of the popular "Granular Citrate of Magnesia," only the latter usually contains some Epsom salt. It may be taken in table-spoonful doses, dissolved in a large quantity of water, as it seldom affects the bowel unless freely diluted.

Sodii Ethylatis Liquor is a valuable caustic, powerful and almost painless; it is antiseptic. Brushed over *lupoid growths* and small *nævi*, it causes their obliteration with very little deformity. It should be applied occasionally, with a glass brush or camel's hair pencil till a scab forms, and then its application should be withheld for a few days till the scab or destroyed cuticle

falls off, when it may be re-applied. If pain results, a drop of chloroform, which converts the ethylate into ether and chloride of sodium, made be laid upon the part.

Sodii Hypophosphis resembles in its action the lime salt of the same name. It has been supposed to give all the benefits of free phosphorus without any of its drawbacks ; but the evidence of its usefulness in *scrofula* and *phthisis* is regarded by several authorities as somewhat doubtful.

Sodii Iodidum resembles closely the iodide of potassium, and can be tolerated by the stomach in larger doses.

Sodii Nitras is only used to prepare arseniate of sodium or nitric acid.


Sodii Nitris has been found to possess similar properties to nitroglycerine and nitrite of amyl ; thus, within 10 to 15 minutes after a dose of 5 grs. there follow flushing of the face, throbbing of the head, increased frequency of the pulse, lowering of the arterial pressure, &c. Dr. Hay has tried nitrite of sodium in *angina* with the most satisfactory results. He has closely studied its chemical action alongside nitrite of amyl and glonoin, and believes that they all owe their activity to the nitrous acid contained in them. (Page 437.)

There appears to be a decided advantage in favour of nitrite of sodium over the amyl salt in the duration of its influence, but it has the corresponding disadvantage of being slower in giving relief unless taken *before* the attack, a disadvantage which caused the great discoverer of the virtues of these salts (Brunton) to discard it in favour of amyl. (See Cobalto-nitrite of Potassium.)

R. M. Simon has used nitrite of sodium with good results in the increased arterial tension of *granular kidney disease*, especially when associated with a weakened and dilated heart. It has also been sometimes employed with marked effect in aortic disease.

It does not cause so much throbbing and headache as Murrell's remedy—nitroglycerine. Lublinski has employed it in *hemicrania* and in *asthmatic complaints* of purely bronchial and neurotic origin with marked success.

Dose—1 gr. will be found quite sufficient to begin with, and rarely will 3 grs. be required. It can be given in solution in water.

 The difficulty always experienced in exhibiting the nitrites in *angina* is to keep up the action as continuously as possible ; the method adopted by the writer (page 437) meets this difficulty.

Sodii Phosphas is a most valuable saline purgative, and can be safely used when most purgatives are contra-indicated—in serious cases of *enteric fever* with bowel complication. It can,

owing to its freedom from unpleasant taste, be given instead of common salt in beef tea or soup. This is a most satisfactory plan of giving a mild cathartic in *fevers*; half an ounce often will be found enough, but three times this quantity may be administered; the effervescing preparation may be tried. It is also recommended in small doses for the qualities which it possesses in common with all the sodium and potassium salts—antacid, diuretic, antilithic, &c.

Sodii Salicylas. See under Acid. Salicylic., page 333.

Sodii Sulphas—Glauber's salt is chiefly used in veterinary practice, though, by its stimulating effect upon the glandular intestinal apparatus, it is a safe and certain purgative. The experiments of Rutherford also prove that it is a moderately powerful stimulant to the liver; and it has been given in 1 dr. doses in *biliary calculi*. See under Magnesii Sulphas. The effervescing preparation is a great improvement.

Sodii Sulphis is a weak antiseptic, preventing fermentation, like sulphurous acid. It is given in 20 gr. doses in various *stomach* affections characterised by the presence of sarcinæ and torulæ, and, in solution, has been used externally in various parasitic skin diseases.

Sodii Sulphocarbolas possesses the antiseptic and antipyretic qualities of carbolic acid. It has been given in *fermentative states of the stomach, cholera, diphtheria, scarlatina*, and all the *fevers*, and in various *septic* conditions.

Sodii Valerianas—Used only to prepare the valerianate of zinc. It may be given in 5 gr. doses.

Spiritus Rectificatus, Spiritus Tenuior, and Vini Gallici. See under Alcohol, page 338.

Staphisagriæ Semina contain at least two alkaloids—Staphisagrine and Delphine. The former is a powerful respiratory poison like curara. Delphine acts like aconite, and when applied over painful cutaneous nerves causes numbness and tingling, and diminishes pain like veratrine. It has been used as an ointment (20 grs. to 1 oz.) in *neuralgia*. Internally it slows the pulse like aconite, and diminishes the number of respirations, causing death by asphyxia with spinal paralysis. It has been given in *asthma, rheumatism, neuralgia*, and *dropsies*.

Stavesacre seeds are, however, introduced into the B.P. on account of the satisfactory power which their ointment possesses over the parasite that frequents the hair of the head. The official ointment destroys pediculi with safety. Formerly the seeds were given internally as an emetic and vermifuge, but their use is now restricted to their antiparasitic action.

Stramonium possesses properties identical with belladonna, and yields an alkaloid which is identical with hyoscyamine and isomeric with atropine. The leaves of the plant have been long used as a remedy when smoked like tobacco for *spasmodic* bronchial affections, chiefly *asthma*. Sawyer recommends the inhalation of the fumes produced by burning a powder consisting of 1 oz. of the powdered leaves, $\frac{1}{2}$ oz. powdered anise fruit, and $\frac{1}{2}$ oz. nitre. This somewhat resembles, in composition, Himrod's and Girdwood's asthma cures. The extract made from the seeds should not be given in doses larger than $\frac{1}{3}$ grain; it sometimes prevents the asthmatic attacks when given a few hours before the expected seizure.

Stramonium belongs to a natural group, called from their action, by Headland—Deliriantes. The group contains Belladonna, Hyoscyamus, Stramonium, and Datura Tatula. (See Datura amongst the Non-official Remedies).

Strophanthus—Professor Fraser first called attention to the effects of this remedy upon the heart. It is a powerful muscle poison, stimulating all striated muscles and finally arresting the heart in systole. It very closely resembles digitalis, though it is more powerful, and its effects upon the circulation are produced mainly by its action upon the heart, as it has only slight influence in causing contraction of the arterioles.

It is diuretic, but not to the same extent as digitalis, and it is also said to be an antipyretic. In every form of cardiac weakness, either arising from functional excitement, valvular disease, degenerative changes, or secondary to renal affections, this remedy during the last seven years has been tried in nearly every country in the world. During this period the writer has been using it extensively in hospital and private practice, and closely watching the reports furnished by clinical observers in America and Europe, and these reports in the main correspond with his own observation that, though the drug is a powerful cardiac tonic of great value, it is, upon the whole, inferior to digitalis, and not less dangerous. It is, however, a most valuable addition to therapeutics, especially as it can be given in those cases which one constantly meets with where digitalis cannot be tolerated, and the writer has noticed that this oftener occurs in mitral obstruction, with a very narrow orifice. Moreover, strophanthus is invaluable as a remedy to be given in the intervals, when it is found wise to suspend digitalis, and in those cases where the latter drug causes trouble by its effects upon the capillaries. It will be found a wise and often highly satisfactory plan to give digitalis for two months, and then strophanthus, combined with Easton's syrup, for one month, in ordinary cases of failing compensation. The reports of the drug differ much

in detail, and this arises from the difference in strength of the preparation used and of the seeds imported. D. Beaumetz gives large doses, and affirms that the tincture is diuretic, but that strophanthin is not. The dose of strophanthin is .002 grain. The writer has obtained good results from the drug in *exophthalmic goitre*.

Strychnina—For the action of this alkaloid see *Nux Vomica*.

Styrax Præparatus—This balsam resembles those of Peru and Tolu in its action, being a feeble, stimulating expectorant. It possesses some tonic influence over the genito-urinary mucous membrane, and has been used in *gonorrhœa*. 20 grs. may be given, made into a bolus with liquorice.

Sulphonal—The following short notice of this drug is taken from the article on Insomnia, in the Author's Dictionary of Treatment :—

Sulphonal has been one of the most valuable of the many recent additions to therapeutics. It is a colourless, odourless, tasteless, insoluble salt, and may be given in doses of from 15 to 60 grs. It is the type of a pure hypnotic, and possesses no analgesic properties. In small doses it possesses the remarkable power of checking or preventing the night sweats of phthisis.

In cases of simple insomnia uncomplicated with pain it acts with much certainty, and is altogether free from the objectionable qualities possessed by chloral. Thus experience has proved that no sulphonal habit has been observed, and though it appears to have *slight* and insignificant cumulative action, there is no necessity for increasing the dose. Sleep does not come on immediately, sulphonal being very slow in its action, and sometimes three or four hours elapse before the soporific effect begins to manifest itself. The duration of its action is about that of chloral—six to eight hours. Professor Leech has drawn attention to the prolonged deferred action of sulphonal, which sometimes causes a drowsiness, which may last for a considerable part of the day following its administration. This is more liable to happen when it has failed to induce sound refreshing sleep after the usual interval. It has been very often noticed that this drowsiness extends into the following night, and some patients who use the drug constantly, find that it produces better effects upon the second night without taking any more of the drug in the meantime. Hence the writer has adopted the practice of only giving sulphonal in full doses every alternate night in simple insomnia. There is no depressant cardiac action, and the respiration and arterioles are not influenced. The only untoward effects worth mentioning are those which occasionally have been

observed in the nervous system. Restlessness, hallucinations, vertigo, giddiness, and confusion of thought, have sometimes, though rarely, been noticed to take the place of sleep.

Ataxia with staggering gait has been several times noticed, and after full doses, the inco-ordination has appeared to resemble drunkenness. In one highly nervous patient afflicted with severe insomnia the writer was informed that most miserable depression followed its administration ; but this was in a subject in whom almost every known hypnotic had produced unpleasant or alarming symptoms.

These after effects of sulphonal have not been known to lead further than to unpleasantness, and the innumerable host of reports which have appeared during the past few years seem to justify the hope expressed by the writer in 1888 that "the days of chloral hydrate are numbered."

Thirty grains partially dissolved in a little warm beef tea or hot water should be given about an hour before retiring to rest. If a moderate dose of whiskey punch be substituted for the hot water the most unobjectionable and certain hypnotic combination will be obtained. When the alcohol is combined with it, the dose should be given as the patient retires to bed.

The writer has noticed that when dissolved in hot punch its effects are much more rapid ; and recently a writer in one of the journals has pointed out that if dissolved in boiling water it will not fall down as cooling occurs. This is a valuable contribution, as the insolubility of the drug is its only drawback. The writer generally gives it in fine powder, made up as a sandwich between two pieces of thin bread and butter, and owing to the insolubility of it in this form, it should be given two or three hours before bed-time. If dissolved in boiling water it may be given upon lying down.

From the above remarks it will be noticed that the range of sulphonal is most extensive. It may be given in the sleeplessness of every disease where pain is absent, and it is, upon the whole, the best remedy for simple insomnia. In insanity, however, it is inferior to paraldehyde and hyoscine, in the opinion of those best calculated to judge, and in all depressed states of the mind its action is less certain. 60 grs. appear to be about equal to $\frac{1}{2}$ grain of morphine in hypnotic effect. It is the best soporific for children.

Sulphur when administered in a full dose (say, 2 drachms) passes unaltered through the stomach, and meeting the alkaline bile, a small quantity is absorbed after its solution in that fluid. This quantity, after circulating through the blood, is excreted by the skin in the form of sulphuretted hydrogen, staining any metallic substances with which it comes in contact. Some of it

is also excreted by the kidneys, as sulphates, and some passes off by the respiratory mucous membrane, which it stimulates. Of the surplus in the intestine a small quantity is converted into sulphides by the bile, and acts as a mild irritant (just as sulphide of calcium would do, if administered); this causes slight purgation, producing large, softened motions. The residue, which constitutes the greater part of the dose, acts by the angularity of its gritty particles, the part of an irritant, like bran, &c., and increases slightly the peristaltic movement of the bowel, and thus aids purgation. This seems to be the most probable explanation of the internal action of sulphur in full doses. Since it exists in large quantities in the bile, sulphur will act as a restorative in some conditions of the system characterised by a deficiency of that fluid. It has been extolled in *chlorosis* by Schulz, where iron had failed.

Its purgative action renders it very useful in the treatment of *hæmorrhoids*, and Neligan believed that in addition to its effect as a cathartic in this complaint, it exercises a beneficial soothing influence over the *hæmorrhoidal* vessels, whereby their calibre is diminished and the symptoms ameliorated.

It has been used as a purgative in *skin diseases*, but it often aggravates if there be active cutaneous inflammation. The new lozenges are a great improvement upon the crude drug.

Sulphur is an expectorant, probably, stimulating as it passes out, the mucous epithelial cells of the respiratory passages, with their cilia.

All the virtues of sulphur are found in a vegetable containing it in considerable quantity (the onion), and it will be found for every purpose the most satisfactory form for the administration of the drug. The Spanish onion, boiled for one or two hours, and eaten freely at bed-time, is a certain purgative, and possesses most decided expectorant qualities. In cases of *chronic catarrh* of the larger *respiratory tubes*, it is more efficacious than any official expectorant, probably because it contains a volatile principle in addition to the sulphur.

Sulphur has been praised as an external and internal remedy in *chronic rheumatism*, and forms a principal ingredient in the "Chelsea Pensioner." (Page 410). Valuable results are obtained in *sciatica* by carefully bandaging the entire limb in flannel after being freely rubbed and sprinkled over with a thick layer of sulphur. In these cases the drug rapidly finds its way into the system.

The sulphides have been highly commended in various *suppurative skin affections*—as *boils* and *acne*; the onion treatment has proved much more satisfactory in the writer's hands than sulphide of calcium, which is occasionally uncertain and intolerable. (See page 368.)

Externally, sulphur is the best known treatment for the *itch*; a thorough application of the official ointment to the skin, after a hot bath and good scrubbing with soap to break up the furrows of the insect, generally proves efficacious. The pentasulphide of calcium, prepared by boiling 2 oz. of powdered sulphur with about half this quantity of mortar, lime-putty, or slaked lime, in half a gallon of water, is a more certain and elegant application, known as Vlemingx's Solution. It should be lightly brushed or sponged over the affected part. It appears to act by instantly giving off sulphuretted hydrogen on coming in contact with organic matter, this gas destroying the insect. It is free from the objectionable greasiness of the ointment, and is less irritating, since no previous scrubbing or soaping is necessary.

Sulphur has been used as a local application to the false membrane in *diphtheria*, either as a gargle or insufflation, as it comes in contact with the mucous membrane H_2S is freely given off.

The recently advocated treatment of phthisis by rectal injections of sulphuretted hydrogen will be noted in the Non-official Remedies.

The ointment is recommended in *acne*, and often does good when well rubbed into the indurated spots. The precipitated sulphur in a lotion is an unobjectionable way to use this remedy for *acne*.

R. *Sulphur. Præcipitat.* ℥ij.
 Glycerini ℥j.
 Aquæ Rosæ ad ℥viiij. *misce.*

Fiat lotio. Applic. mane nocteque.

Potassa Sulphurata acts like sulphur when given in very small doses; in large doses it is an irritant poison, and produces narcotic symptoms and convulsions. It is recommended in 3 grain doses in various chronic *skin* diseases. (See *Calx Sulphurata*.) Externally, it is used as a bath (5 oz. to a large bath of warm water) in *scabies*; or the official ointment may be employed.

Sulphuris Iodidum—This remedy possesses some of the properties of the two substances entering into its name. It is principally used externally as a remedy in *parasitic diseases* and occasionally in *acne* and *scrofulous affections*. From experience of its use in an agricultural district where *herpes circinatus* was exceedingly common (being transmitted to the human species from the cow), this remedy was found more certain than any other, scarcely ever failing to entirely remove all traces of the parasite when applied a few times to the diseased spots. It is,

however, liable to produce irritation of the skin, but this greatly depends upon the method of its preparation, the official ointment requires great care and laborious trituration, otherwise the hard, gritty iodide is left in little masses, which produce local inflammation of the skin.

Sumbul—This root is supposed to possess nervine tonic properties closely resembling valerian and musk, and has been used as a substitute for this latter drug in low *typhoid* states and *fevers*, *asthma*, *delirium tremens*, and *epilepsy*

Tabaci Folia—Owing to its uncertain action in small doses, and its deadly power in large doses, tobacco is very seldom employed in medicine. When smoked, the leaf is one of the most valuable sedatives for the *restlessness* of an *overworked* and *worried brain*; but there can be little doubt that the mass of smokers become the slaves of habit, and in them very little, if any, therapeutic result is observed. Occasionally atrophy of the optic nerve follows excessive smoking.

Tobacco is a local irritant; when used as a snuff it is a good errhine, increasing the nasal mucus. Chewed in the mouth, or smoked, it acts first as a stimulant to the nerve endings in the salivary glands, increasing the amount of saliva. If its use be continued, or the dose increased, this effect gives way to paralysis of these nerves, and dryness of the mouth results. On reaching the stomach tobacco exercises the functions of an emetic; this result follows its use also by the rectum. Finding its way into the blood, tobacco produces, in large doses, contraction of the pupil, collapse, great muscular prostration, coldness of the skin, diuresis, vomiting and purging, diminution in the force of the heart (which it appears to first tetanise and then paralyse), and, after producing general paralysis through its action on the cord and on the nerves, it causes death by the respiratory muscles being paralysed. The brain is not disturbed in its functions, and the temperature falls.

Subcutaneous injection of nicotine causes death as rapidly as prussic acid, and the late official enema was a dangerous preparation, and has been wisely omitted.

Its paralysing effects have led to its successful use in the treatment of *tetanus*, *strychnine poisoning*, and *asthma*. Small doses, as the smoking of a pipeful, are believed to be diuretic and laxative to those unaccustomed to its influence. Its use in surgery in causing *muscular relaxation* is now given up for chloroform.

Tamarindus—The pulp of the tamarind is seldom used alone; it is a laxative in doses of 1 to 2 oz., increasing the peristaltic movements of the intestines. It is said to be refrigerant, and is occasionally used in fevers in the form of

"tamarind whey," made by mixing an ounce of the pulp in a little boiling water, and adding the infusion to a quart of milk. Its refrigerant action may be accounted for by the vegetable acids, malic, citric, &c., which it contains.

Taraxaci Radix has long enjoyed the reputation of a tonic, cholagogue, diuretic, and laxative. As it is now obtained from the chemist it has little therapeutic power. The tonic effects of the *fresh* juice, prepared by the patient immediately before use, or even of an infusion prepared just after the root is gathered, when the juice is bitter, are decidedly good, and it is a useful vehicle for more active tonics.

Terebinthina Canadensis, though possessing all the properties of the oil of turpentine, is only used for its physical qualities. It is largely used in the preparation of microscopic objects, and has been occasionally given (made into a pill) with carbonate of magnesium for *gleet* and *chronic gonorrhœa*.

Terebinthinæ Oleum externally acts as a counter-irritant. The ordinary turpentine stupe is made by sprinkling the oil over flannel cloths wrung out of very hot water, and applying them quickly to the part. In this way rapid vesication can be produced.

Small doses produce contraction of the capillaries, and the vapour causes the minute pulmonary vessels to contract after inhalation.

In large doses, turpentine acts as a general stimulant, and, if it does not purge or pass off by the bowels, it causes inebriation, like alcohol, and in very large doses it depresses the functions of brain, medulla, and cord, dilating the vessels, and lowering blood pressure and respiration. After circulating in the blood, it is eliminated by the skin, respiratory mucous membrane, and kidneys, acting as a diaphoretic, expectorant, and diuretic; and is useful in *bronchitis* and *hepatic dropsy*. It is apt to cause strangury and bloody urine, and should be used cautiously where the kidneys are diseased. Turpentine also possesses very decided anthelmintic properties, but must be given in large doses ($\frac{1}{2}$ oz.), and its combination with castor oil renders it much less liable to cause strangury than if given alone. The *tape-worm* is dead on its expulsion after the use of this remedy.

The vapour of turpentine is a valuable hæmostatic in *hæmoptysis*, if the air of the patient's room be saturated with it. Large doses are valuable in *internal hæmorrhages* by reducing the blood pressure, and 20 minims every hour may save life in hæmorrhages from the bowel in *typhoid fever* and *dysentery*. *Hæmaturia* has been successfully treated by small doses. Dr Nicholson has obtained good results with turpentine in *secondary syphilis* and *phagedenic ulcerations*, and observed that it caused

the coagulation of the blood in an *aneurismal sac*. The enema is a valuable remedy in *tympanitic distention of the abdomen*; it excites such uniform contraction as expels all accumulations of imprisoned gas in the bowels. Turpentine has a prophylactic and curative action in cases of *gall stone*, and it may cause the solution of small calculi in the gall bladder. It is a powerful antiseptic, and has been given in drachm doses with success in *diphtheria*; it has also been recommended internally on account of its astringent action on the cutaneous capillaries in *psoriasis*, *eczema*, *pityriasis*, &c. Cecchini injects the oil into the opening in *anal fistula* and fistulous tracts in connection with *diseased bone*.

Oil of turpentine which has been kept some time is rich in ozone, and is a valuable antidote to the poison of phosphorus.

The confection has been found beneficial in *iritis*, in *hysterical affections*, and in the *hæmorrhages of purpura*, in which latter it is invaluable. Turpentine may be best given in capsules. Dr. E. Nelson gives 3 drs. of turpentine, 3 drs. ether, 1 oz. syrup of tolu, 1 oz. mucilage, and 5 oz. Aq. M.P. in table-spoonful doses.

Theobromæ Oleum is introduced into the B.P. as a basis for suppositories.

Theriaca is introduced into the B.P. as a pill excipient. In large doses it is laxative and nutrient.

Thus Americanum is not used internally. It is added to plasters on account of its mild stimulating influence on the skin, and also on account of its toughness and adhesiveness.

Thymol acts as a feeble caustic, and as a powerful antiseptic. 1 gr. dissolved in 2 oz. water makes a solution which instantly puts a stop to putrefactive or fermentative changes in any fluid to which it may be added. It is thus a more potent antiseptic than carbolic or salicylic acids; an ointment (1-8 of vaseline) has been used by Squire as a remedy in *parasitic skin diseases*. A solution of 1 part of thymol in 18 of petroleum or 15 of ether is a valuable remedy in ringworm of the scalp or beard; it penetrates into the hair follicles.

The following formula is used at the London Throat Hospital in *laryngitis* and *bronchial affections*:—Thymol, 20 grs.; spirit, 3 drs.; carbonate of magnesium, 10 grs.; water to 3 oz. A tea-spoonful to a pint of water at 150° for each inhalation.

Burns, washed first with a watery solution ($\frac{1}{2}$ gr. to 1 oz.) and then brushed with an oleaginous solution ($\frac{1}{2}$ gr. to 1 dr.), heal rapidly.

A solution in water (1 in 1,000) is used as an injection in *leucorrhæa*, and as a lotion to *wounds*, *chronic eczema*, *ozæna*, *psoriasis*, and *ulcerated throat*. Thymol gauze and lint are used

as antiseptic surgical dressings, and a 1 per cent. solution is used *warm* to swill out the abdominal cavity after perforating peritonitis.

Internally, thymol has an action like carbolic acid, and also produces symptoms like those seen in turpentine poisoning. The centres in the medulla and cord are paralysed, the temperature, respiration, and blood pressure falling markedly before death. It is eliminated by the bronchial and renal surfaces; according to Brunton, these surfaces are congested, and the lungs and kidneys are inflamed in animals poisoned by thymol. It has been given by Silva in *typhoid fever*, *pleurisy*, and *pneumonia*, in doses of 3 grammes; it caused persistent diminution of temperature, and no ill effects whatever. Good results have followed its administration in *chronic cystitis* with profuse discharge, and it has been recommended in *diabetes*. In *diphtheria*, Warren gives it in combination with chlorate of potassium, quinine, and brandy.

Bozzolo urges the administration of thymol in *cholera*.

It should never be given in solution, as it causes a burning sensation in the throat and mouth.

Volkmann's Antiseptic Liquid consists of thymol 1, alcohol 10, glycerine 20, and water 1,000 parts.

Tragacantha—This gum is only employed to aid the suspension of heavy metallic powders in mixtures, it swells upon the addition of water into a thick mass or mucilage, which readily diffuses through any quantity of water. In the official mucilage of tragacanth it is doubtful if the gum can be correctly regarded as in a state of perfect solution.

Uva Ursi is a vegetable astringent and tonic, owing to its contained tannin. It contains arbutin, which, after absorption, is split up into hydrochinon in the blood, and, as the sulphate of this body, it passes out in the urine; it is highly recommended in *chronic inflammatory conditions of the bladder* where there is much discharge. It has been used with advantage in *menorrhagia*, *dysentery*, and *gleet*. (See under Arbutin, in the Non-official Remedies.)

Uvæ—Raisins are gentle laxatives; they are used principally for their flavour.

Valerianæ Rhizoma—Valerian acts as a tonic and stimulant to the nervous system, and is especially useful in *hysteria*. It contains a volatile oil, which paralyses the cerebral nerve centres and cord, and reduces the blood pressure, and slows the pulse (Brunton). Large doses of the infusion of the rhizome increase the rapidity and force of the ventricular contractions, cause an increase in the cutaneous secretion, and produce hiccough, nausea, vertigo, and slight mental disturbance. The good it effects in disease appears to the writer *to be owing to its diminishing the*

irritability of the terminations of the sensory nerves throughout the body. This probable explanation of the action of valerian mentioned in a former edition of this work is supported by the results of Martel's recent observations. This surgeon found that a strong decoction possessed marked *local sedative* influence when applied to *painful wounds*. He states that the inhabitants of Normandy use a lotion made from the root to relieve the pains of fractures and wounds.

It has been used with doubtful success in *diabetes insipidus*, *chorea*, *epilepsy*, *whooping-cough*, *laryngismus*, &c.

The salt of zinc with valerianic acid, in addition to its anti-hysterical properties, is a weak anti-periodic; and, combined with quinine and opium, is a valuable remedy in the treatment of *neuralgia*, especially if there be a tendency to show signs of periodicity, and it has been recommended in *diabetes*.

Veratrina & Veratri Viridis Rhizoma. (See Sabadilla).

Vinum Aurantii and Vinum Xericum are introduced into the Pharmacopœia for their solvent properties; the former to make quinine and citrate of iron wines, and the latter to form the menstruum for the remaining wines.

Zincum and its salts. When used externally these substances are astringent and corrosive.

The astringent quality probably depends upon their forming insoluble albumen compounds, causing condensation of the tissue elements, at the same time producing contraction of the smaller vessels. The corrosive action depends upon their affinity for water, which they rapidly extract from the tissues, thereby causing their death. The effect varies in intensity from the powerful action of the chloride and iodide to the mild influence of the sulphate or oxide.

When administered internally, the zinc salts soon enter the blood, in which fluid they remain for a time, probably as albuminates, and are gradually and slowly eliminated in the fæces and slightly by the kidneys. After a long course of zinc medication, symptoms of chronic poisoning may show themselves, not unlike those seen in cases of lead poisoning.

Acetate of Zinc—This salt is used as a local astringent, and with some skilful practitioners is their favourite remedy in *gonorrhœa* and other discharges. The following is a valuable injection, and with 6 times as much Tr. Lavandulæ Co. constitutes the "Red Lotion" of Hospitals.

℞. *Zinci Acet.* gr. xxv.
 Tr. Lavand. Co. ℥. xxv.
 Aquæ Destillatæ ʒx. *misce.*

Fiat injectio, secundis horis utenda.

Carbonate of Zinc and *Calamina* are used as mild, unirritating astringents or "drying applications" to *excoriations*, *intertrigo*, &c. They resemble the oxide in their action upon *eczema*.

Chloride of Zinc is much used as a powerful caustic by surgeons for the destruction of *lupoid*, *cancerous*, and other *growths*. It is best applied mixed with about three parts of dry flour, and laid upon the diseased spot. Great care is necessary to prevent its spreading to the surrounding healthy parts; this is best accomplished by sprinkling them over with plaster of Paris. Jules Felix applies for 6 to 24 hours the following in fine powder made into a putty with water:—dry chloride of zinc, 110; starch, 37; wheaten flour, 112; corrosive sublimate, 1; iodol, croton chloral, bromide of camphor, and carbolic acid, of each, 10. This paste is painless, does not spread, and keeps indefinitely.

The astringent qualities of the chloride have rendered it a valuable remedy in *gonorrhœa*, injected in the proportion of about 1 gr. to the ounce every two hours. It destroys the low organisms upon whose presence the disease depends. It is a powerful antiseptic and deodorant. The liquor diluted with forty times its bulk of water arrests putrefaction and decomposes all gases with which it comes in contact. It may be used as a lotion to *putrid ulcers*, in the proportion of 3 minims to each ounce of distilled water. Burnett's fluid is a concentrated impure solution.

Oxide of Zinc is chiefly used as a mild, soothing astringent in *eczema*. The zinc ointment is the best remedy for the troublesome *eczema of childhood and infancy*.

Internally, the oxide is found to enter the blood as lactate or chloride, and to exercise the functions of a mild astringent and sedative to the nervous system.

In the *sweating of phthisis* the oxide has long enjoyed a high reputation, and may be used in the following form:—

Rx. *Zinci Oxidi* gr. v.

Ext. *Belladonnæ* gr. ss. misce.

Fiat pil. mitte tales xvi. st. i. ter in die.

Sulphate of Zinc is the most popular local astringent, and is used in the following strengths in each oz. of injection:—

In *Gonorrhœa*, 2 grs.; in *Leucorrhœa*, 3 grs.; in *Otorrhœa*, 1 gr.; in *Ophthalmia*, 1 gr.

The dried salt is used as a caustic to *uterine* and other *ulcers*.

Internally, the sulphate has been found highly useful in *chorea*; given in doses, beginning with 2 grs. for a child of about 7, increased to 10 grs., 3 times a day. The stomach in a very short

time becomes markedly tolerant of large doses. Its use has been advocated in *epilepsy* and other *convulsive ailments*, in *bronchorrhœa* and *diarrhœa*, but with varying success.

In doses of 30 grains, sulphate of zinc is the speediest and safest emetic, and is especially useful in cases of poisoning, being quicker in its action than ipecac., and much less liable to be followed by depression than tartar emetic. It acts by irritating the nerve endings in the stomach, and hence has been regarded as the type of "Direct Emetics." It is not a safe emetic for young children, but may be given in doses of $2\frac{1}{2}$ or 3 grs. to a child one year old, when an urgent action is required, and the dose may be repeated in 15 minutes. For a child 5 years old 10 grs. may be given, followed by copious warm water draughts.

For the *Valerianate of Zinc* see Valerian.

Oleate of Zinc acts like the ointment of the oxide (see page 332).

Sulphocarbolate of Zinc possesses the properties of the sulphocarbolates (page 491). It is used as an antiseptic lotion in *gonorrhœa* and *leucorrhœa*, 2 grs. to 1 oz.

Zingiber is a powerful aromatic stimulant, acting like capsicum and cardamoms (which see); chewed, it is a valuable sialagogue; and used as snuff, it causes severe nasal irritation.

PART V.

NON-OFFICIAL REMEDIES.

Abrus Precatorius.—See Jequirity.

Acetophenone.—See Hypnone.

A.C.E. Mixture.—See page 381.

Acetyl-Phenyl-Hydrazin.—See Hydracetin.

Acid. Alpha-Oxynaphthoicum is a newly discovered naphthol derivative, existing as a white, almost inodorous powder, scarcely soluble in water, though it dissolves in glycerine and oils. It costs little and has powerful antiseptic properties, being 5 times stronger than salicylic acid. It promises well as a disinfectant. It has not been used internally as far as the writer knows, and its insolubility is a barrier to its use in medicine and surgery.

Acid. Eugenicum.—See Eugenol.

Acid. Gynocardicum.—See Chaulmoogra Oil.

Acid. Catharticum is a brown, nearly tasteless, soluble purgative powder obtained from senna. It has been given to children in *constipation*, dissolved in sweetened water, in doses of 1 to 2 grs.; 6 grs. may be given to adults. It gripes less severely than senna. The magnesium and lime salts of this acid Dragendorff has demonstrated to be the purgative principles of senna.

Acid. Hydrofluoricum is a powerful corrosive liquid, readily attacking glass and causing a deep destruction of animal tissue. The diluted acid (1 in 600) has been successfully given in *goitre* by Woakes, in doses of 20 to 60 minims. The fumes of the acid have been inhaled with great benefit in *diphtheria*, but the remedy has never obtained wide trial. Garcin thought that the immunity of glass makers from *phthisis* was owing to the destructive action of the agent upon the bacilli, and he treated patients by keeping them for an hour in a chamber whose air was acidified by the acid, and though he reported success, the treatment has been allowed to fall into disuse. Fluorides of

ammonium and iron have been administered in cases of *splenic enlargement* by Lucas, 5 to 30 min. of a 1 in 120 solution. Salufer is the name of a disinfectant consisting of neutral sodium silico-fluoride.

Acid. Osmicum, used in the preparation of microscopic specimens, and known as perosmic acid or tetroxide of osmium, has been found of real value in a variety of neurotic ailments. A hypodermic injection of 5 minims of a freshly prepared 1 per cent. solution into the tissues over the painful spots in the course of neuralgic nerves has been found to cure the disease in patients who had tried other remedies without effect. Bilotz found it to cure *sciatica* which had resisted treatment for years, when injected deeply between the ischium and trochanter. Occasionally it fails, but no ill effects have ever been noticed from its use.

The writer has found benefit from it in unpromising neuralgias of various regions. 15 minims may be injected, but the solution should be freshly prepared. He injects deeply 1 to 2 minims in 5 to 10 places over the course of the sciatic nerve in *sciatica*. It has been injected into *strumous glands* and *cancers*, and deeply into the muscles in *lumbago* and *muscular rheumatism*, but with varying success. Wildermuth has reported the results of two years' trial of the drug in many cases of *intractable epilepsy*. In some, marked amelioration of the symptoms occurred. He gave the aqueous solution, but found better results from $\frac{1}{64}$ gr. osmiate of potassium in pill, 15 of which was the maximum daily allowance. No ill effects were noticed.

Acid. Picricum (Trinitro-carbolic Acid). A yellow substance formed by slowly mixing carbolic with fuming nitric acid; it is known as Picric or Carbazotic acid, and is used as a yellow dye. It has been introduced as a test for albumen in the urine, and a saturated solution of the acid in water throws down a cloud, even when the albumen is in small quantity; about a drachm of the saturated solution may be poured gently into a test tube half filled with urine, and allowed to float upon the surface. It is not necessary to add any acid before heating with this test, as it acidifies the urine sufficiently. It is used also as a test for sugar in the urine. By boiling the suspected liquid with picric acid and caustic potash, if glucose be present the yellow acid is converted into the red picramate of potassium, the depth of colour indicating the strength in sugar.

It has been tried in *erysipelas*, apparently with some advantage. The saturated solution should be painted over the affected parts. Negative results have followed its administration as an anthelmintic, antiperiodic, and as a remedy for *trichinosis*; its administration generally produces yellowness of the skin. (See also under Ammonium Carbazotate.)

Acid. Pyrogallicum constitutes the white feathery crystals which sublime upon heating gallic acid. It is a powerful antiseptic from its affinity for oxygen. Introduced by Jarisch in cutaneous affections, it has been found useful in the form of his ointment (1 dr. to 1 oz. of lard) when rubbed into the patches of *psoriasis*. It does not cause irritation of the skin, apparently spending its energies upon the diseased spots and leaving the healthy dermis unaltered. If applied, however, in concentrated form, it is a powerful local irritant, and has been used to cause the destruction of *epithelial cancers, chancres, lupus, &c.* It stains the skin and hair dark, though not so deeply as goa powder.

$\frac{7}{8}$ grain in solution every hour has been proved useful in *internal hæmorrhages*, but it is a dangerous drug in large doses, and the daily amount administered should not exceed 10 grains. It reduces the temperature like antipyrine, but not in safe doses; it dissolves the blood corpuscles and profoundly depresses the nervous system. Alarming symptoms have followed the application of the ointment, which should only be applied to limited surfaces, and several deaths have occurred in *psoriasis* from its use. Vidal applies it in powder mixed with four times as much starch, and blown upon *phagedenic chancres*, or applied as an ointment (1 in 6).

Acid. Scleroticum is one of the active principles found in ergot; it is not, however, a pure substance, but consists mainly of Ergotinic Acid. It is doubtful if it will cause contraction of the uterus, and the results attributed to its action have been caused by other principles of ergot which were incorporated with it.

Marckwald believes it has hæmostatic powers. It may be given hypodermically in doses of $\frac{1}{2}$ gr. dissolved in 5 minims of water; the solution must be fresh. Better results will follow the use of the B.P. Ergotin.

Acid. Sulphocarbohcum.—See Aseptol.

Acid. Trichloroaceticum is a crystalline antiseptic body soluble in water, and when applied to the skin acts as a caustic. 1 per cent. solutions destroy nearly all forms of bacterial life without causing irritation of the skin, and have been found useful as a dressing for *wounds, ulcers, venereal sores, erysipelas, &c.*

Internally, 2 to 5 grs. of the acid in dilute solution have been recommended in *diarrhœa, gastric catarrh, and gastric cancer*, and as a preventive of *cholera*.

Excellent results are reported from its use in the concentrated form when applied as a caustic in *chronic pharyngitis*.

Acid. Trichlorphenicum is derived from carbolic acid and exists in acicular crystals. It is insoluble in water, but forms soluble salts with alkaline bases which have been used as antiseptic

dressings and as disinfectants, being much stronger than carbolates. The magnesium salt, 4 grs. to 1 oz., has been used in *conjunctivitis* and *purulent ophthalmia*.

Trichlorophenic Acid is also known as Trichlorophenol. It is stated to be 25 times stronger than carbolic acid.

Adonis Æstivalis has been much used in Italy, and Albertoni, after experiments, reports that he has found it of great value in cardiac insufficiency, with rapid pulse, dyspnœa, anasarca and diminished amount of urine. It is a powerful diuretic, in doses of 2 grs. in infusion every 6 hours. It closely resembles in its action Adonis Vernalis. Possibly, Adonis Autumnalis will be also found to be a cardiac tonic.

Adonis Vernalis resembles digitalis in its action; it contains a glucoside—adonidin—which resembles digitalin, and which has yielded good results in the hands of Bubnoff, though it possesses more irritant action upon the stomach and bowels. Various active principles are found in the so-called adonidins, and the difficulty of determining the real value of the drug arises from the varying composition of different specimens. Oliver gives adonidin in $\frac{1}{8}$ gr. doses in chloroform water.

It has been given in *cardiac diseases*, where it has strengthened the ventricular contractions, and reduced the frequency and increased the strength of the pulse, with very little action upon the arterioles. It is not cumulative. It is doubtless a remedy of great power, but it is doubtful if it will accomplish in failing compensation as good results as digitalis. It can, however, be given in the intervals when digitalis is suspended. Da Costa points out its chief indication to be dilatation of the heart, and finds it is not well borne in hypertrophy. One table-spoonful of an infusion ($\frac{1}{4}$ oz. to 10 oz.) should be given every three hours. The discovery and isolation of a bitter, soluble glucoside by Podvysotzky has cleared up the discrepancies about the value of this drug. He calls it Picro-adonidin.

Æsculus Hippocastanum, or horse-chestnut, has been long tried in various complaints, and it has been highly recommended in diseased conditions of the rectum and anus. In painful *hæmorrhoids*, especially where there is little bleeding, and no constipation, a trituration of the fruit in 3 gr. doses in the hands of Dr. R. Hughes has given good results. Mayhoffer, of Nice, has found it rapidly effective in pharyngo-laryngitis, and Percy Wilde believes that it will prove of great value in the common combination of congested liver and pharyngeal catarrh.

Æther Hydrobromic and Hydriodic.—(See Æthyl Bromidum).

Æther Methylicus has been used as a general anæsthetic. It is an inflammable gas with an unpleasant ethereal odour,

prepared by distilling a mixture of methylic alcohol and sulphuric acid. A saturated solution in ether, under the name of methylic-ethylic ether, has been used as a substitute for chloroform by Richardson, but it is not likely to come into general use owing to its rapidity of volatilizing and its disagreeable odour.

Æther Oxalic is a colourless liquid, prepared by the action of oxalic acid on absolute alcohol, introduced by Richardson. It is decomposed when administered hypodermically, at the point where it is introduced into the system, where it coagulates the albuminous tissues, and produces with very little pain a dry eschar, without giving rise to constitutional disturbance. He regards oxalic ether not as an ordinary caustic, but as a destroyer of tissue, and recommends its application by the brush or injected by a hypodermic syringe, to destroy vascular growths.

Æthyl Bromidum, or Hydrobromic Æther, is a liquid obtained by the action of sulphuric acid and alcohol on bromide of potassium, or by distilling a mixture of phosphorus, alcohol, and bromine. It has been extensively tried in America, where it was introduced by Turnbull and Lewis, as an anæsthetic, especially in ophthalmic practice. Its action upon the heart and respiration is the same as that of chloroform, from which it differs in the *rapidity* of its action (2 or 3 minutes) and the *promptness* with which patients come from under its influence; it has, however, the drawback of being more irritating to some patients. It certainly has been demonstrated to be much more dangerous than chloroform or ether, and as a general anæsthetic its use should be abandoned. It is not inflammable, and is valuable for its *local* anæsthetic effect, which can be produced by simple contact with a little of the liquid on lint, covered or not with oiled silk, or better still by being sprayed upon the part by an atomizer or spray producer. It has also been administered internally as an antispasmodic.

This drug should not be confounded with Ethylene Bromide, which see.

Æthyl Chloridum is a colourless ethereal, inflammable liquid, closely resembling sulphuric ether in its action; it is introduced as a local anæsthetic for *neuralgia*, *toothache*, &c. It may be used in the form of a spray, or by being blown through a capillary tube in a fine jet it soon produces insensibility in the area of skin to which it is applied.

The formula of this substance, which is also known as muriatic ether, is $\text{C}_2\text{H}_5\text{Cl}$. Chloride of Ethyl is wrongly used as a synonym for Ethidene Dichloride.

Æthyl Iodidum, or Hydriodic Ether, is a liquid prepared in the same way as ethyl bromide, by substituting iodine for bromine

It has been tried with success in *cardiac dyspnœa* and in *spasmodic affections* of the *larynx* and *bronchial tubes*, and has been used as an inhalation in *bronchitis* and *catarrhal laryngitis*, causing dyspnœa. It is an expectorant, and often gives relief in *asthma*, by cutting short the attack or rendering the breathing easy and deep. It should be used like nitrite of amyl, and can be had in glass capsules, 5 min. in each, as recommended by Martindale. It affords the best method of saturating the system rapidly with iodine, upon which substance the activity and efficacy of its action to some extent depends ; 3 or 4 capsules may be used at once.

Agaricus Albus, White or Purging Agaric, is a fungus growing upon the old trunks of the larch in central and southern Europe.

15 grs. of the powdered fungus, or $\frac{1}{10}$ gr. agaricine (a white crystalline powder) has a very decided action in checking the night sweats of *phthisis*. It was formerly used as a purgative, and in large doses causes watery stools ; in small doses it checks *diarrhœa* and *dysentery*, and is useful in *hæmoptysis* ; it diminishes the secretion of the bronchi and mammæ.

Murrell first used it for the night sweating of phthisis. Pribram finds that agaricine is a scarcely ever failing remedy for the suppression of excessive perspiration, especially in phthisical patients. In cases of suppression of copious perspiration by agaricine, the cutaneous and pulmonary discharges remain essentially unaltered ; the urinary organs discharging the surplus of liquid, and the diminished thirst decreasing ingestion of liquids. Moderate perspiration yields to a single $\frac{1}{6}$ -grain dose, whilst profuse sweating requires repeated equal or increasing doses for its suppression, the physiological action of the drug manifesting itself five hours after its exhibition. There are no undesirable after-effects attending its use, and it leads to improvement of the subjective state of phthisical patients by eliminating a constant drain on their flagging strength, without, of course, altering the pathological tissue changes themselves. It may cause diarrhœa.

Pope has used it in Bellevue Hospital in doses of $\frac{1}{8}$ gr. at bedtime, and repeated usually twice during the night, or, sometimes, $\frac{1}{8}$ gr. every 4 hours, with uniform success. He gives it in 10 minims of aromatic sulphuric acid. Jonng gives $\frac{1}{12}$ gr. with $\frac{1}{6}$ gr. Dover's powder in pills.

Alembroth Salt, or Ammonio-Mercuric Chloride, is the substance formed when solutions of corrosive sublimate and sal ammoniac are mixed together. It exists in rhombic prisms, which are very soluble in water, and which do not very readily combine with albumen. For this latter reason it is prized as an antiseptic dressing, being much less irritating than solutions of

pure sublimate. It is the salt which some authorities recommend for hypodermic injection in syphilis. Bloxam uses the following solution for this purpose :—32 grs. sublimate, 16 grs. chloride of ammonium, in distilled water 2 oz.; the dose of which is 10 minims. (See author's Dictionary of Treatment, page 836). 3 grs. sal alembroth contain 2 grs. sublimate. As a dressing it is generally used in the form of gauze containing 1 per cent., and coloured blue by aniline. The pink gauze—Eucalembroth—contains in addition eucalyptus oil.

Allium, or Garlic (U.S.P.)—The volatile oil—Sulphide of Allyl—obtained from the clove of garlic is a powerful expectorant of the stimulating class, and markedly increases the bronchial secretion, and renders it less difficult in being expelled. Garlic appears to act like the onion (see page 495) upon the bronchial mucous membrane during the process of excretion by this channel. It is valuable also as a rubefacient in *bronchitis*, and is a certain anthelmintic, killing the round worm. It is a powerful antiseptic, and in the concentrated form will produce vesication, purging, and vomiting. The oil is not given internally, owing to its irritant qualities, but the freshly expressed juice in 30 minim doses, or the tincture of the bulblets (1 to 5) in dessert-spoonful doses, will act as a valuable expectorant and diuretic; $\frac{1}{2}$ oz. of the syrup of the U.S.P. is the most agreeable preparation. The drug is rapidly absorbed when applied to the skin, and then it sometimes acts as a powerful diuretic. It may be given by the rectum.

Althæa, or Marshmallow Root, has been long recognised as a valuable demulcent and emollient, and enjoys great popularity in *bronchitis* and *catarrhs*. The entire plant—leaves and young branches—made into a fomentation (4 oz. of the dried herb to 1 pint), has been used to prevent suppuration and to relieve pain and tension in the *inflamed mammary gland* and in various *acute joint affections*. An ointment made by boiling the chopped leaves in lard (1 to 1) and straining has been in use for a variety of skin affections; and has been recommended in the treatment of *palmar psoriasis*.

Althein is a crystalline body identical with *Asparagin*, and may be obtained from the root of marshmallow and asparagus. It possesses diuretic qualities, and is, in medicinal doses (2 grains dissolved in 4 drachms of water) a remedy in *cardiac dropsy*, *Bright's disease*, and *gout*, which has given results worth further trial.

Alumen Ammonio-Ferric, or Iron Alum—This pale violet-coloured salt is an ammonia iron-alum, in which ferric oxide replaces oxide of aluminium.

It possesses stronger astringent properties than ordinary alum, is more soluble and less irritating in small doses, and may be used where an unstimulating iron salt is indicated with a good astringent. It is in *hæmorrhage from the kidneys*, and especially in *intermittent hæmaturia*, that its virtues have been found to surpass those of other astringents; 5 to 10 grs. given 4 times a day will be found to diminish the albumen in *Bright's disease*. 1 dr. to 8 oz. water makes a good astringent gargle in relaxed and inflamed conditions of the throat.

Aluminium Aceto-Tartrate is a newly discovered salt, very readily soluble in water; it has a pleasant taste, and is not poisonous. It possesses powerful antiseptic properties, and is considered by Athenstædt to be more stable and easily prepared than the Acetate of Aluminium, which is a powerful antiseptic, more energetic than thymol and salicylic acid. It is likely to be used in antiseptic surgery, and as a general disinfectant.

Alveloz is the name given to the juice extracted from *Euphorbia heterodoxa*, which has been used lately in America and on the Continent as a local painless caustic when applied to ulcerating *cancerous tumours*. The best results have been seen in *epithelioma*. The juice is preserved from decomposition by the addition of a little salicylic acid. In cancer of the os and cervix it has given excellent results as a caustic by relieving pain, checking hæmorrhage, and diminishing discharge, and thus prolonging life.

Amaranthus Spinosa, the fresh root has been found by Deb to act as a mild diuretic and specific in *gonorrhœa*, in which disease it effects a speedy cure. As many as 5 or 6 roots may be daily chewed. The taste is not disagreeable. Shortly after administration painful erections, micturition, and discharge cease. Externally the powder has been applied to *eczema* with success. It is also laxative in doses of the weight of a rupee, to be chewed daily.

Ammonium Carbazotate, or Picrate, is prepared by mixing solutions of ammonia and picric acid and collecting the yellow crystals which form on concentrating. It has been administered in various diseased conditions with very doubtful benefit, and in full doses is a powerful poison, producing diarrhœa and convulsions; even in small medicinal doses it induces a bright yellow colour of the skin and conjunctiva, with a markedly strong and disagreeable cutaneous exhalation, and gastric disturbance. Hammond has shown that the drug, in pills containing 1 gr. each three times a day, possesses marked power over *exophthalmic goitre*. He gives 2 gr. pills during the second week, and 3 gr. pills during

the third week, when the pulse is found to fall and the eyeballs to return to their normal state.

Amyl, or Anodyne Colloid, is a thick liquid used for painting over the course of painful nerves in *neuralgia*, *sciatica*, &c. It is prepared by dissolving 6 grs. veratrine, 1 gr. aconitine, 1 oz. hydride of amyl (Pentyl hydride) in 1 oz. collodion.

Amylene Hydrate is a colourless tertiary alcohol soluble in less than ten times its bulk of spirit. It acts like chloral, but unlike this drug it has little depressing effects upon the heart. There is little or no preliminary excitement, sleep occurs often in a few minutes, and resembles in every respect natural refreshing slumber; it seldom fails in its action even in those accustomed to narcotics, and no after ill consequences follow on awaking. It may be safely given to children. To adults it may be given in doses of about 30 minims in claret or suspended in a flavouring syrup, or it may in the same dose be administered by the rectum, or given in capsules. Its strong taste and smell, and its high cost, are the only barriers to its use. No ill effects have been noticed after doses as high as 2 drs, but occasionally symptoms resembling alcoholic poisoning have been recorded. It has been used successfully in a number of serious ailments, as *delirium tremens*, *mania*, &c., and Wildermuth has obtained excellent results in *epilepsy* of a severe type where bromides fail; also in *petit mal* and in *pertussis*. It should not be given in epilepsy till a considerable interval after the cessation of bromide treatment. The drug is also known under the name of Dimethyl-ethyl Carbinol.

Amylum Iodatum, or Iodized Starch, has a place in the U.S.P. It consists of iodine 5 parts, triturated with a little distilled water, and rubbed carefully with prepared starch 95 parts. It is used as a means of administering iodine, and may be given in doses of 2 drachms rubbed up in milk or water. It can be employed as a dry dressing in every case in which iodoform is indicated. It has also been recommended as an antidote in poisoning when the nature of the poisonous drug is unknown.

Anacardium or Cashew Nut—The oily liquid obtained from the pericarp has been held to be a cure for *leprosy*. Martindale states that it contains 90 per cent. of anacardic acid. Internally it has been given as an anthelmintic, but it is chiefly used as an external application to *ringworm* and *leprous ulcerations*. It has been seldom employed in this country.

Anemonin.—See Pulsatilla.

Anthrarobin—Liebermann has always held the view that chrysarobin acted by its affinity for oxygen, robbing the cutaneous parasites of the oxygen necessary for their existence as

it became rapidly changed into chrysophanic acid. In his search after a cheap and unirritating substitute for chrysarobin, he obtained from the well-known colouring substance—alizarin—a new body closely allied to chrysarobin, which he calls anthrarobin. This substance greedily absorbs oxygen, and changes again into alizarin. Brouson and Behrend have carefully tested the value of the new substitute in *psoriasis* and *ringworm*, and many other conditions in which chrysophanic acid was indicated, with unmistakable success. It is a coarse yellowish powder, soluble in glycerine and spirit (1 in 10); a ten per cent. ointment was generally used. This is prepared by rubbing up 1 dr. of the drug, with 1 dr. olive oil, and adding 1 oz. lard. Rubbed into the eye-lids and face for weeks, it caused neither pain nor irritation. It, however, leaves a yellow stain on the skin and colours the hair red. It is quicker in its action than pyrogalllic acid, and free from the danger attending that drug. It is, however, slower than chrysarobin, and much cheaper.

Antiseptol is a brown, insoluble powder without odour, obtained by mixing solutions of iodated iodide of potassium and sulphate of cinchonine. It is the iodosulphate of cinchonine and contains 50 per cent. of iodine, and is introduced as a substitute for iodoform on account of its cheapness and freedom from odour, by Ivon, who maintains that it is more efficacious as an antiseptic. Shoemaker has used it with excellent results in the form of an ointment (1 dr. to 1 oz. zinc ointment) for *lupus*, *ulcers*, &c. Internally it has been given by Woodbury in doses of 1 to 5 grs. in *phthisis*, and by Shoemaker in *scrofuladerma*, *lupus*, *syphilis*, and *psoriasis*.

Antithermin, or Phenyl-hydrazin-levulinic Acid, is a coal tar derivative. The anhydride only is used in medicine, and it possesses properties closely allied to antipyrine; thus it reduces fever heat, and has powerful analgesic qualities. It causes irritability of the stomach and vomiting; the ordinary dose in tabloid form is 5 to 7 grains.

Antrophores are soluble medicated bougies, containing the active substance enclosed in a nickel-plated spiral. Their basis is gelatine and glycerine. 2 to 5 per cent. thalline is the most commonly used remedial agent. Lohnstein has used them in *gonorrhœa* with great success. In acute cases the antrophore is inserted only into the anterior part of the urethra, and in chronic cases into the prostatic portion. The bladder should never be entered. A single bougie is sufficient for 24 hours, and the discharge begins at once to alter in character for the better. The writer sees no advantages which are likely to follow their use which cannot be more safely and certainly obtained by injections of permanganate of potassium.

Apiol—A green oily liquid, the active principle of the fruit and root of parsley (*apiol petroselinum*). It is a powerful diuretic; in large doses (1 dr.) it produces effects like quinine, ringing in the ears, headache, and vertigo. It was formerly used as an antipyretic, and has been proved to possess some power over *ague* and intermittent neuralgia. It has antiperiodic powers, and is chiefly recommended in *dysmenorrhœa* and *amenorrhœa*, given immediately before the expected menstrual period, in capsules containing 3-5 minims. Its use is indicated in the class of cases said to be benefited by permanganate of potassium, *i.e.*, those, where without any obvious reason the menstrual discharge disappears for one, two, or three times.

Apocynum Cannabinum—The root of American Indian hemp or Canadian hemp exerts an action upon the heart like digitalis, and is a reliable diuretic if the proper dose be administered. Sokoloff finds that it raises arterial tension markedly by stimulation of both cerebral and spinal vaso-motor centres. G. Murray has shown that it resembles strophanthus more than digitalis, as it has no effect upon the arterioles. He strongly recommends it in *mitral disease*. It is given with advantage in *dropsies of cardiac and renal origin*, and its power over effusions is said to be so great that it has been called in America the "Vegetable Trochar." Dose of a decoction (1 to 40) 1 to 2 oz., or of a tincture (2 oz. to 1 pint) 10 to 40 minims, or of the liquid extract 5 minims, or of the active principle—apocynin—as an expectorant, $\frac{1}{4}$ to $\frac{1}{2}$ gr. If given in fuller doses it is a hydragogue cathartic.

Arbutin is the active principle of *Uva Ursi*. It is a glucoside introduced by Lewin, who believed that it was split up in the system—Hydrochinon appearing in the urine, which becomes brown or olive green on exposure. It is not poisonous; the hydrochinon into which it decomposes is a powerful antiseptic, even in 1 per cent. solutions. It exerts its therapeutic action in passing out of the system while the urine is collecting in the bladder. He found it of benefit in *chronic cystitis* and *vesical catarrh arising from obstruction*, &c., and in *suppurative conditions* of any part of the *urinary tract*. It may be given in the form of powder in 20 gr. doses, in water. Lewin's researches prove that if any benefits are to be obtained from *Uva Ursi* leaves they must be given in much larger doses—1 oz. made into an infusion—and the tannin contained in the infusion should be removed by agitating it with powdered vegetable charcoal. It has been recently stated to act upon the muscular fibres of the uterus like ergot, and though reports claim for it a specific effect in *leucorrhœa* and *urethritis*, it has not gained ground. Some affirm that it passes out of the system unchanged.

Aristol, or Dithymoldiiodide, is a brownish, amorphous, odourless powder, prepared by the action of thymol upon iodated iodide of potassium solution. It is insoluble in water, but mixes well with oils and fats, and is unstable, being decomposed by heat and light, and it contains about 46 per cent. iodine. It is introduced as a substitute for iodoform, and already its literature is extensive, glowing with reports of its curative powers in every diseased condition in which iodoform has been used. In *lupus* it has given excellent results, and Shoemaker has pointed out the explanation of the adverse reports made by some observers. The drug has no action upon the unbroken skin, and therefore does not affect lupus which is not already freely ulcerating. The preliminary application of a caustic is thus necessary in all early cases. Eichhoff, who introduced it, found that it did not affect nasal lupus owing to the position of the bacilli. It may be dusted in powder over the lupoid ulcers, or applied as a 10 per cent. ointment. It is not absorbed, and is not, therefore, toxic, as iodoform is, but it can be of little value when given internally.

In *scrofuladerma*, *epithelioma*, and all late *syphilitic ulcers*, it has been most efficacious, and Shoemaker corroborates the reports of other observers who have witnessed the formation of healthy granulations upon cancerous ulcerations under its use.

Keyser uses it for corneal ulcers (10 grs. to 1 oz.).

Numerous reports of its value have been published in the following conditions:—*tinea*, *gonorrhœa*, *chancres*, *psoriasis*, *eczema*, *ozæna*, *otorrhœa*, *rhinitis*, &c. In vaginal and uterine ulcerations it may be used as a pessary. In psoriasis the best plan is to apply a 10 per cent. solution in flexile collodion, or a 10 per cent. starch paste, or a plaster (20 per cent.). For chancres and ulcers of the legs a good plan is to freely sprinkle them with a mixture of equal parts of aristol and oxide of zinc or prepared calamina.

The iodides of diiodophenol, diiodoresorcine, diiodosalicylic acid, and of cresol are also brown powders which are being used as antiseptics.

Asclepias Incarnata, or White Indian Hemp, has been found to act as a diuretic in some cases where other well-known diuretics had failed to give relief in *renal* and *cardiac dropsy*. It appears to possess the important advantage over squill, digitalis, broom, and other diuretics in not causing vomiting or gastric disturbance, and in not interfering with the bowels. It acts upon the heart, strengthening its beats, as digitalis does. Dose of the fluid extract (1 in 1) $\frac{1}{2}$ to 1 dr. four times a day.

Asclepias Syriaca appears to possess similar properties; both drugs are, however, very uncertain in their action upon the kidneys.

Asclepias Tuberosa, or Pleurisy Root, is allied to the previous remedy. It produces in dr. doses of the powdered root, diuretic effects, and is a good expectorant. In larger doses it is an active cathartic and emetic. It is, however, chiefly used as a diaphoretic in the early stages of fevers, and combined with more powerful expectorants in bronchial catarrhs.

Aseptol, or Sulpho-Carbol or Sozolic Acid, is a liquid which contains $\frac{1}{3}$ of its weight of orthophenolsulphonic acid in water. It has a faint odour like carbolic acid. It resembles, in its properties, both salicylic and carbolic acids. It differs from the former in being very soluble, and from the latter in being less caustic, and in being perfectly harmless. It has been consequently used in abdominal surgery in 5 per cent. solution. Annessens maintains that its antifermenting, antiputrid, and disinfectant properties are more energetic than those of salicylic and carbolic acids, and that it will advantageously replace carbolic acid as a prophylactic and disinfectant in times of epidemics, and as a curative remedy wherever carbolic acid is employed for hygienic purposes, and in medical, surgical, and obstetric practice. It is also known as Sulphocarbolic Acid.

Asparagin. (See under *Althæa*, page 510.)

Aspidospermine is an active principle of Quebracho Bark, which has been used in *cardiac asthma* and in all varieties of *dyspnœa*. It is a powerful drug and must be used with caution. Harnack and Hoffmann found quebracho bark to contain six alkaloids, four of which are crystalline; the most active of these is quebrachine and the least active is aspidospermine. The aspidospermine of commerce appears to be a mixture of all these alkaloids. It is, however, advisable to employ a liquid preparation of the bark, owing to the difficulties in obtaining the alkaloids in a pure state. The greatest value of the bark, according to the above mentioned authorities, consists in its property of reducing the irritability of the respiratory centre. It proves beneficial in relieving *dyspnœa* depending upon disorders of the circulation, or diseases of the heart. Da Costa has found benefit from 20 minim doses of the liquid extract every hour in the *asthma* arising from failure of cardiac contraction; the pulse was reduced 20 beats without any alteration in the arterial pressure. It has been given in pulmonary *emphysema* with advantage, and in "*spasmodic* croup. Large doses of aspidospermine have a marked antipyretic action. The mixture of alkaloids known as the commercial aspidospermine has been given in doses of $\frac{1}{3}$ to 1 gr., dissolved in water acidulated with sulphuric acid. Hydrochlorate of quebrachine has been given

hypodermically and by mouth, in doses of 1 gr. It acts as an emetic, like apomorphine, speedily and energetically.

The pure sulphate of aspidospermine lowers the temperature markedly in *fevers*, in doses of $\frac{1}{30}$ grain.

Astragalus Mollissimus or Loco Plant—Ott prepares a watery solution of this remedy by allowing a strong tincture to evaporate, and by dissolving the residue in water he obtains a solution which he finds to possess the power of depressing the irritability of the motor nerves and paralysing the sensory ganglia and the heart. It increases the saliva, and markedly causes dilatation of the pupil, and is a strong narcotic. He used the solution locally as a mydriatic.

Auri et Sodii Chloridum is an orange-yellow deliquescent powder, which has been found to give results superior to the salts of silver in various nervous diseases. Small doses ($\frac{1}{25}$ gr.) increase the appetite and promote constructive metamorphosis; larger doses, according to Bartholow, increase waste—the tissue yielding most readily being the *connective*, especially that of pathological formation—hence its usefulness in *sclerosis*, and he affirms that it has cured *posterior spinal sclerosis* and *interstitial nephritis*. Results which appear to warrant confidence in this drug have been obtained in *hystero-epilepsy*, *melancholia*, *sexual debility*, nerve diseases characterised by spasm, as *laryngismus*, *asthma*, *chorea*, in *cirrhosis of the liver*, *amenorrhœa*, &c., and in various ovarian and uterine affections. In *tertiary syphilis* it seems to act like the chloride of mercury. In concentrated form it acts as a caustic. Dose, $\frac{1}{20}$ to $\frac{1}{10}$ gr., in pill or dissolved in water, twice daily.

Azedarach—The bark of the root of *Melia azedarach* is used very frequently in America as an anthelmintic to destroy *ascarides lumbricoides*. 1 oz. is boiled in 10 oz. of water to half its original bulk, and of this $\frac{1}{2}$ oz. is given every 2 hours till purging occurs. If purging does not soon follow, castor oil or other cathartic, should be given. There are much more effectual, pleasant, and safe vermifuges.

Baptisin is the impure resin extracted from the root of the wild indigo, which is one of the eclectic remedies. In the form of powder—1–5 grs. in pill—it has been found to cause vomiting and purging. It is believed to be an hepatic and intestinal stimulant of considerable power, it has been useful in *amenorrhœa* and in *low typhoid states*, and as a local stimulating alterative to *fetid gangrenous sores*.

Barium—The observations of various writers have proved that salts of barium have very decided action upon the heart and

vessels and muscles. Dr. Bary finds that these salts act upon the heart like digitalis in nearly every respect. Their action also resembles, in some degree, that of physostigmine. Injected into the veins they, like pilocarpine, greatly stimulate the salivary glands. The blood pressure is increased, and there is marked contraction of the blood vessels. The chloride was the salt experimented with. There is yet no accurate data to guide one in determining the dose. Shoemaker mentions a case where death followed the administration of $2\frac{1}{2}$ grs. in daily doses of only $\frac{1}{4}$ gr. An ointment rubbed over enlarged veins failed to give any evidence of contractile action.

Basham's Mixture is the Mist. Ferri et Amm. Acet. U.S.P. It consists of tincture of chloride of iron 2 parts, diluted acetic acid 3 parts, solution of acetate of ammonium 20 parts, elixir of orange 10 parts, syrup 15 parts, and water 50 parts. A valuable method by which the diuretic and astringent qualities of iron may be obtained. Dose—one table-spoonful thrice daily. It has been a prized combination in this country, generally extemporised by prescribing the tincture of perchloride of iron and Mindererus spirit in a mixture.

Benzin, or Petroleum Ether U.S.P., is a transparent colourless inflammable liquid distilled from American petroleum. It has been used in 30 min. doses as an anthelmintic for *tape-worm*, and as a remedy when mixed with lard or oil for the *itching of painful skin affections*, and as a counter-irritant like turpentine when applied undiluted.

Benzol is a colourless, inflammable liquid obtained by the dry distillation of benzoic acid or by acting upon coal tar. It has been used in *skin affections* chiefly as an antiparasitic and antiseptic. Owing to its great solvent action upon alkaloids it has been suggested by Shoemaker as a means of effecting the absorption of these through the unbroken cuticle. It is seldom given internally, but has been tried in *trichinosis*.

Benzosol, or Benzoyl-guaiacol, is, according to the authority of Helbing, prepared by the action of benzoyl chloride upon a potassium salt of guaiacol. It has been introduced as a palatable form in which to administer guaiacol in *phthisis*, in which disease it has been given in 5 grain doses with marked benefit, mixed in sugar or chocolate. It does not appear to possess any advantage over guaiacol, save in being less nauseous, and it is not likely to come into very general use owing to the difficulty in producing it in a pure and uniform condition. (See under Creasote and Guaiacol.)

Benzoyl-Anilide, or Benzanilide, is a colourless compound in scaly crystals obtained, according to Helbing, by the action of

benzoyl chloride on aniline. It has been given as an antipyretic to children in doses of 3 to 8 grs., but as the newer antipyretics have come into general use it probably will soon be forgotten. Kahn has obtained excellent results from it in *pneumonia*, *meningitis*, and *phthisis* in children.

Benzoyl-Eugenol, or Benzeugenol, is the benzoic ether of eugenol. (Eugenol is an oxidation product of oil of cloves.) It exists in colourless, inodorous crystals, which are bitter and only slightly soluble in water. This new antiseptic is suggested as a substitute for creasote and guaiacol in the treatment of *pulmonary phthisis*. It has been injected in this disease in 10 per cent. solution in sterilized olive oil. Owing to its less objectionable taste it is preferred to both eugenol and guaiacol. It is given in the same doses as these drugs.

Benzoyl-Naphthol, or Benzonaphthol, is a colourless, tasteless, and almost odourless crystalline powder, obtained by acting on benzoyl chloride by beta-naphthol. It is used as an antiseptic, and when given internally it acts like most of the naphthol compounds as a disinfectant to the stomach and intestinal tract; in doses of 6 grs., in tabloid form, to be given every 3 or 4 hours.

Benzoyl-Tropine—Filehne was led to examine this body—a compound of benzoic acid with tropine—after finding that most of the benzoyl derivatives were, like cocaine, local anæsthetics. He found it to be a powerful local anæsthetic acting on the pupil at the same time like atropine. It can be used like cocaine in ophthalmic practice.

Berberis Aquifolium, or Holly-leaved Barberry root, has been extensively tried in America made into a tincture (1 to 5). It is said to be an alterative and tonic in 20 minim doses, and has been reported useful in various forms of *syphilis* and *struma*. It also possesses antiperiodic powers, and has been recommended upon slender grounds in a host of affections.

Betol is a body in small white tasteless crystals analogous to salol only having the base of naphthol. It is a salicylic ether of naphthol, and splits up in the body into salicylic acid and naphthol. It has been described and used by Kobert under the name of naphthalol. This observer and Sahli have given it in *rheumatism* and *cystitis*, and often with great benefit; both, sometimes, found it to fail when least expected. Kobert, however, affirms that it is preferable to salol in rheumatism; it may be given in doses of 10 to 15 grs. every 6 hours. It contains 10 per cent. less salicylic acid than salol.

Bile Salts, Taurocholate and Glycocholate of Sodium, are extracted from ox-bile, and have been used with success by

Granville in *gouty obesity* and *dyspepsia*. In patients with inherited gout and a tendency to accumulation and deposition of fat in the omentum and elsewhere, coupled with a deficiency of production and maintenance of heat, pills containing 4 grs. of the mixed salts rendered the stools characteristically rich in bile, without purging. The food was readily digested, and the accumulation of fat seemed to melt slowly away, being burned off as a nutritive fuel in the system.

They appear to be a decided improvement upon the official *Fel Bovinum Purificatum*.

Bladder Wrack.—See *Fucus Vesiculosus*.

Blatta Orientalis—Cockroaches have been used by the Russian peasants for centuries as a remedy for dropsy. Bogomolow, Fronmüller, and others found that, when given in the form of powder, infusion, or tincture they greatly increase the quantity of urine, diminish the amount of albumen, and rapidly reduce anasarca and ascites. It was found that their virtues depend on *blattic acid*, which forms soluble salts with potassium and sodium. These salts were found to be powerful diuretics, acting by exciting the secretory elements of the kidney. They slow the pulse in small doses and accelerate it in large doses, and cause falling of the blood pressure and paralysis of the cardiac muscle. Bogomolow named the active principle *Antihydropin*. He gave the powdered beetles in 4–5 gr. doses to children thrice daily.

Boldoa Fragrans—The leaves of the boldo tree, a native of Chili, are used as substitutes for quinine. Dose — 10-20 minims of a tincture (1 to 8) in *dyspepsia*, *atony of the bladder*, *cystitis*, *gonorrhœa* and *Bright's disease*, *rheumatism*, and *cirrhosis of the liver*.

Recently a glucoside under the name of Boldo-glucine has been isolated from the leaves ; it has been tried by Juranville in capsules and by the rectum in 1 dr. doses as an hypnotic. It produced sound refreshing sleep without bad consequences. He recommends it strongly in the insomnia of *mania*.

Borneol is a camphor obtained from the trunk of *Dryobalanops camphora*, where it exists in fissures in the wood. It is heavier than water, and has an odour resembling ordinary camphor ; it is much more expensive and is greatly prized by the Chinese, but it does not appear to possess any marked differences from the ordinary laurel camphor. An artificial product sold under the same name is obtained, according to Shoemaker, by acting upon oil of turpentine, with hydrochloric acid.

Boroglyceride is the name given to a semi-solid glacial substance, prepared by heating together 46 parts of glycerine with 31 parts of boracic acid till the product ceases to lose weight. Some of its food-preserving and antiseptic properties are mentioned under Acid. Boric. (page 325). Valuable results have followed its use as an emollient application to *eczema* and many skin affections. Recently, in addition to its being extensively used as an antiseptic and surgical dressing, it has been mixed with an equal weight of glycerine, when it forms a honey-like liquid, which makes an elegant base with alkaloids, iodine, iodoform, carbolic acid, &c.

Turnbull finds a 50 per cent. solution a satisfactory remedy for *trachoma* and many *conjunctival affections*, brushed over the everted lids or dropped into the eye twice daily.

Bromal Hydras is a crystalline substance prepared like chloral hydrate by replacing the chlorine with bromine vapour. It is much more irritating than chloral, and more decidedly narcotic. It has a more dangerous depressing effect upon the heart, and causes great excitement before sleep supervenes. It should be used with caution. It has been recommended in *epilepsy*, but in *safe* doses it is useless. 5 grains is a full dose. Sometimes it relieves pain and produces sleep when other narcotics have failed. It is a powerful caustic and cutaneous irritant.

Bromoform has been used as a general anæsthetic by Horroch, who has administered it to animals with satisfactory results. The anæsthesia is of long duration and not followed by any unpleasant after effects, especially vomiting. It causes, however, great irritation of the conjunctiva and respiratory passages, and is equally annoying to the administrator, and should not be used for this purpose.

It has been found to control the violence of the spasms of *whooping-cough*, and has given excellent results in this disease in 5 to 10 minim doses in water and tincture of orange. Stepp highly recommends it in this disease, and advises that it be given dropped into a spoonful of water, in which it sinks like a button.

Bromol.—See Tribromophenol.

Brucia is an alkaloid in small whitish, bitter, acicular crystals, obtained from *nux vomica*. In physiological and therapeutic action it closely resembles strychnine (only it is considerably weaker, and is eliminated with much greater rapidity). It increases very markedly the reflex activity of the spinal centres. (See *Nux Vomica* in the Therapeutic section of

this work.) It has been recommended in *epilepsy*, in doses beginning with $\frac{1}{20}$ grain, gradually increased to $\frac{1}{2}$ grain in solution in water and a little spirit.

Bryonia—The fresh and dried roots of *Bryonia alba* and *Bryonia dioica* are used in medicine. The U.S.P. orders the recently dried root (2 oz. to 1 pint). It is a hydragogue cathartic of dangerous power, and is given in *dropsies*. The fresh leaves will produce vesication, and have been used as counter-irritants. Bryonin, a bitter principle contained in it, appears to act as a tonic not unlike quassia.

Bryony is believed to have a powerful effect in controlling inflammations of serous membranes. 1-10 mins. (B.P.C. Tincture) have been given with or without aconite in *acute pleurisy*, with much benefit. In *acute rheumatism*, combined with salicylic acid, or alone, it has produced good results. It may be given where aconite is indicated in acute febrile conditions. An infusion, 1 in 10, has been found to possess strong styptic properties.

Cactus Grandiflorus—The flowers and fleshy branches of this plant made into a tincture have been found to produce remarkable action upon the heart. In painful *palpitation* from functional causes it has been stated by Cullen and others to give great relief. Other observers state that it has cardiac tonic properties and diuretic powers like digitalis, and it has been administered in *angina* and *valvular lesions* with benefit in doses of 5 to 10 minims of the fluid extract. The tincture (1 in 5) is given in doses of 5 to 20 minims. It has also been recommended in *exophthalmic goitre*.

Cæsium and Rubidium—S. S. Botkin has published the results of a series of experiments made with the chlorides of these metals, his results in the main agree with those of Ringer. The pulse is slowed and strengthened and the arterial pressure raised. The pneumogastric centre and the peripheral inhibitory apparatus of the heart are stimulated. In other respects there is a close resemblance between their action and that of potash salts. 5 grs. may be given in water every 4 or 6 hours.

Calcii Pentasulphidi Liquor is mentioned under Sulphur—page 496. It is not official, and hence is referred to here. It is by far the best remedy for *itch*, which it cures rapidly and completely. The writer has used it in numerous cases with unqualified success, and has been enabled to stamp out this troublesome disease in a large school in one day. It has only to be brushed over the skin or well mopped on with a sponge, and allowed to dry of itself. The entire body may be so treated

at bedtime and the patient put to bed, when the superfluous sulphuretted hydrogen will disinfect without soiling the bed clothes or garments.

Camphora Carbolata is an oily liquid, prepared by mixing 1 part of carbolic acid and 1 of alcohol, and adding $2\frac{1}{2}$ parts of camphor. Injected hypodermically it produces local anæsthesia like cocaine, and it has been injected deeply into the lung in *phthisis* with some benefit, with the intention of killing the bacilli. It relieves *toothache* when inserted into the carious cavity. A mixture with olive oil has been used successfully by Soulez as a non-irritating antiseptic dressing for wounds.

Camphora Monobromata (Brominated, Monobromated, or Bromide of Camphor) is a crystalline solid, or in long acicular crystals in which bromine replaces an atom of the hydrogen of camphor. In large doses it produces great muscular prostration, convulsions, reduction of temperature and pulse, slowing of the respiration, coma, and death. In medicinal doses (5 to 10 grs.) it has been used in *delirium tremens*, *epilepsy*, *hysteria*, *chorea*, *neuralgia*, *pertussis*, and *asthma*; not with sufficiently good results to warrant its use when better known available remedies are at hand. Wood has seen it do good in *spermatorrhæa*. It is an hypnotic of no mean power. The drawbacks to its use are its unpleasant taste and smell, its irritative effect upon the stomach, and the local irritation following after hypodermic injection.

It is best given in the form of pill or capsule.

Camphoric Acid—Reichert has found that this substance exercises a marked destructive action upon the tubercular bacilli in the body when a solution is injected into the peritoneal cavity. He strongly recommends its use in *laryngeal phthisis* applied as a spray or linctus in 4 per cent. alcoholic solutions. He also uses it as an internal remedy in *acne*. It has been given internally in *the night sweats of phthisis*, in *cystitis*, *irritability of the bladder*, and *incontinence of urine*, and in a host of nervous diseases, as *epilepsy*, *chorea*, &c., in doses of 2 to 5 grs. Its best effects are seen in the first-mentioned disease, the action often lasting several days. A $\frac{1}{2}$ per cent. solution has been used for washing out the bladder.

Canadol is a colourless, very volatile liquid obtained from naphtha. It has been introduced in Russia as a cheap and efficient substitute for ether in producing local anæsthesia, and with the ordinary Richardson's spray apparatus Studensky has demonstrated that in some respects it is better, especially in the certainty and rapidity of its action, complete congelation of the tissues being sometimes produced in 45 seconds.

Cannabin Tannas is a yellowish powder obtained from Indian hemp, and free from the poisonous volatile oils. It has been used in cases where Indian hemp was indicated, but it is uncertain and inconstant in its action. Dr. Fronmüller has found it "a useful hypnotic, powerful without being dangerous, and one which does not disturb the secretions or leave unpleasant toxic after effects if given in proper dose." Dose—5 grs. in pill; for *insomnia* it may be increased to 10 or 20 grs.

Occasionally, good results have followed its administration in *acute mania*. Wood has found it to be inert, and the reports are contradictory, perhaps from the varying purity of the samples of the drug experimented with.

Cannabinon is a purified resin obtained from Indian hemp, and has been recently tried by Richter and others; though much more certain and powerful than the previous drug, it, too, occasionally proves inert. It has been given with good results in the sleeplessness of *mania* in doses of $\frac{1}{4}$ to 1 gr. Cannabine—the pure alkaloid may be given in 1 grain doses.

Cantharidin occurs in flat, glistening crystals; and Dietrich advocates the abandonment of all other preparations of cantharides for solutions of various strengths in formic acid, turpentine, oils, collodion, lard, &c. 1 in 300, or about 1 gr. in 5 drs., will cause vesication. It is a terrible poison, and should never be given internally. Recently Liebreich has introduced cantharidinate of potassium as a new remedy in *tuberculosis*, and great interest has been attached to his methods and results. He administers by hypodermic injection $\frac{1}{2}$ to 2 decimilligrammes—i.e., $\frac{1}{1300}$ to $\frac{1}{324}$ gr. Serum is exuded from the capillaries throughout the body after this agent has been introduced into the blood, and Liebreich believes that this exudation works in two ways: (1) By supplying increased pabulum to badly-nourished cells, these may be brought back to the healthy standard; (2) It may act beneficially by its disinfecting action on the diseased spot. He states, "That if it can be proved that in cantharidin we possess a means of producing an increased secretion of serum at any one spot, we may succeed in concentrating at this spot efficacious substances, which, under ordinary circumstances, do not easily find their way there. We know substances that circulate in, and are decomposed by the blood, but which only with difficulty pass through the kidneys. But if we know that at an affected spot the exudation from the capillaries is facilitated, we can imagine that a larger quantity of an efficacious substance may find its way to this spot, thus strengthening the otherwise feeble disinfecting power of the serum. It seems to me not unlikely that such a combination of two remedies might possibly lead to a new therapeutic method. As regards practical application,

special attention should be paid to the kidneys. It is clear that this treatment should not be applied where there is disease of the kidney." It has been tried in *lupus* also, and many excellent recoveries have been exhibited, and many observers have reported striking improvements in cases of pulmonary phthisis in which injections had been used ; in *tubercular* and in *chronic laryngitis* successes are also claimed by the introducer of this treatment. In the "Therap. Monatsh" of June, 1892, Liebreich, in replying to the criticisms on his method, affirms that increased exudation from the capillaries does take place, but without hyperæmia, and that a steady decrease has been demonstrated in the diseased process in *lupus*, but that much time may be needed. He states that advanced tuberculosis must be treated with the greatest caution, as the kidneys may be affected with lardaceous disease, and he condemns all local applications as irrational, and he reports that in hundreds of injections made by him there has been no more danger to the patient than from the administration of arsenic or mercury.

His solution is made by dissolving with the aid of heat 2 parts of cantharidin, and 4 of hydrate of potash in 200 of water, and adding water to 10,000 parts. 4 to 16 minims of this liquid may be injected hypodermically.

Capsella Bursapastores is known as "Shepherd's Purse." This plant has been long used, as the puff-ball was, as a domestic remedy for hæmorrhage. Bomelon has investigated its properties, and finds an active principle which he calls Bursine. He recommends the fluid extract of the plant (1 in 1) in doses of 1-2 drs. as a substitute for ergot in hæmorrhages.

Carbonic Acid Gas—Dupont has found decided effects in *pulmonary* diseases from *inhalations* of this gas ; it is probably owing to the CO_2 that any good results have been obtained by rectal injections of H_2S . In *phthisis*, *asthma*, and *bronchitis*, he administers daily 150 litres of a mixture of 1 part of CO_2 and 3 of oxygen, and claims for it power of destroying bacilli, easing pain, and reducing temperature. Schott, in heart diseases, uses an artificial Nauheim bath (60 gallons), consisting of $1\frac{1}{2}$ lbs. of chloride of sodium, $\frac{1}{2}$ lb. chloride of calcium ; the CO_2 being supplied by adding $2\frac{1}{4}$ lbs. of bicarbonate of soda and $2\frac{1}{4}$ lbs. hydrochloric acid. Bergeon, who introduced the rectal administration of sulphuretted hydrogen gas, has recently advocated the administration of carbonic acid gas by the same route. Some physicians have carried out this treatment by the administration of alkaline carbonates by the mouth, followed immediately afterwards by acid draughts ; the CO_2 being disengaged in the stomach is excreted by the pulmonary tract, where it is supposed

to act upon the bacilli. There is no evidence that any lasting benefits have resulted from this treatment.

Carbon Disulphide, in solution of the strength of 4 minims in 1 pint of water, is a powerful antiseptic, destroying all bacterial life. It has been found useful as a dressing to *foul sores*, and as a spray in *diphtheria*, and as an inhalation in *cholera* and *typhoid fever* when given internally at the same time. When the vapour is inhaled it produces *anæsthesia*, like chloroform, only the insensibility is shorter. Externally, the liquid is a painful irritant, and has been used as a counter-irritant in *scrofulous adenitis*. The spray produces local anæsthesia like ether. Its disgusting odour is a serious drawback to its use, and, moreover, it is a powerful poison. Recent reports from Chili state that 2 oz. doses of a saturated solution of the drug in water, when given with milk before meals, relieved *dysentery*, *dyspepsia*, *typhoid fever*, &c.

Carbonis Detergens Liquor is a concentrated alcoholic solution of coal tar. Under Pix, page 454, the uses of wood tar are mentioned in *eczema*, especially the *scaly variety*, *psoriasis*, &c. This liquor will give much better results, and the writer has found it to act with surprising power upon *inveterate eczema*. Hutchinson recommends a lotion of 1 oz. Liq. Plumbi Subacet. and 7 oz. Liq. Carb. Deterg. A tea-spoonful mixed with 10 oz. water, as a lotion, to be applied on lint to the parts at night, and covered with oiled silk, and an ointment consisting of $\frac{1}{2}$ dr. of the Liquor Carbonis, $\frac{1}{2}$ dr. Liquor Plumbi, 15 grs. White Precipitate, and 1 oz. vaseline, to be applied in the day time. The liquor upon being added to water makes an emulsion, which is a powerful antiseptic, and can be used for *foul wounds*, *putrid sore throat*, or taken internally in *bronchial affections*, *winter cough*, *hæmorrhoids*, &c.

Carbonis Tetrachloridum—The vapour of this colourless, mobile liquid will produce general anæsthesia, like chloroform, but its effects are very transitory, and it is seldom used except to relieve local pain and discomfort, as in *hay fever*, *asthma, tic*, &c., when the vapour may be inhaled with benefit. When applied over the seat of neuralgic nerves and pained joints it gives relief speedily. It can be applied upon lint, and covered over with thin mackintosh, or it may be sprinkled upon spongeopiline. It is seldom given internally.

Carduus Benedictus, or Blessed Thistle, resembles in some respects the following drug. There is little doubt that its virtues have been much exaggerated. It is, however, a good bitter tonic, resembling in some respects calumba and dandelion. It

is much used on the Continent as a tonic and mild cholagogue in *dyspepsia* and in hepatic congestions in doses of 5 to 10 grs. of the extract or 1 oz. of the infusion (1 in 10).

Carduus Mariæ, or *Silybum Marianum*, or Mary Thistle, is an old remedy revived by Lesenevich, who found it very efficacious in *hæmoptysis* in 15 to 20 minim doses of the tincture of the seeds in water, every two hours. Krasnikoff has obtained very satisfactory results from this remedy in *hæmoptysis* where *digitalis* and *ergot* had previously been given and failed. Tripiier gives it with aloes in constipation from hepatic disease in 2 gr. doses, and it has been extolled as a remedy for *gall-stones*.

Carlsbad Salt, according to Harnack, owes its therapeutic virtues entirely to the chloride, sulphate, and bicarbonate of sodium in its composition, and he accordingly gives the following form for its *artificial* preparation:—Sodium Sulphate 10 parts, Bicarbonate 8 parts, and Chloride 4 parts. Its action can be readily anticipated by a survey of its composition; it has been highly appreciated as a mild saline purgative in dessert-spoonful doses, dissolved in a tumblerful of water, in *constipation* associated with diseases of the kidneys and liver, and in *gout*, *rheumatism*, &c. The natural salt is no doubt more valuable, as it contains all the constituents of the natural Carlsbad water, but the natural salt in *large* crystals, though valued most in this country, is much inferior to the *fine* crystals which are now prepared with the greatest care at the springs, being, after their production from a concentrated solution of the natural water, submitted for long periods to an atomised spray of the natural water, as the writer learns from those who have witnessed the process of manufacture at Carlsbad.

Casca Bark, *Erythrophlœum Guineense*, or Sassy Bark, has been made the subject of a series of able experiments by Brunton and Pye. It closely resembles *digitalis* in its physiological effects. The dose is 10 minims of Dr. Brunton's tincture (2 oz. of the bark to 1 pint of rectified spirit).

Dr. Sansom has employed the tincture substitutively for *digitalis* in a considerable number of cases, but was unable to convince himself that it has any more beneficial effect in *mitral disease*. Brunton has found it useful in *dilated heart without valvular disease*, in *mitral disease*, and in *dropsy*.

The powder causes violent sneezing, and Hartnack thinks the alkaloid acts like a combination of digitalin and picrotoxin. It disturbs the digestion more readily than *digitalis*. It should not be confounded with *Cascara Sagrada Bark*.

Recently Lewin made the interesting discovery that the alkaloid has powerful local anæsthetic action like cocaine. (See under *Erythrophlœine*.)

Cascara Amarga, or Honduras Bark, is the bark of a Mexican tree of the order Simarubaceæ. It has been used in America as a remedy in *syphilis* and as an alterative in various *chronic skin affections*, *hepatic diseases*, and *nasal catarrh*. Its advocates agree about its uselessness unless tobacco and alcohol be abstained from. Dose— $\frac{1}{2}$ dr. of the fluid extract representing an equal weight of the bark.

Casearia Esculenta is an Indian drug of repute among the Hindus. Hooper found that the root contained cathartic acid and a large amount of tannin. It acts as a mild purgative, and has been found to possess valuable cholagogue properties. Though it has been vaunted as a specific in *diabetes* and numerous other diseases, it does not appear to possess any very marked action save in chronic *hepatic affections*, *hæmorrhoids*, and *ascites* depending upon hepatic enlargement. The dose is very bulky—2 drs. of the powdered root (this may be given in sugar), or 15 to 20 grs. of the semi-solid extract or dessert-spoonful doses of the liquid extract (1 in 1) may be administered.

Castanea—The leaves of the Spanish or edible chestnut have found a place in the U.S.P. The fluid extract (1 in 1) has been found to possess considerable influence over the paroxysms of *whooping-cough*. Its *modus operandi* is unknown, but the drug is perfectly harmless and may be given in tea-spoonful doses.

Caulophyllin—An eclectic remedy prepared from the root of *Caulophyllum thalictroides* (U.S.P.), blue cohosh, or squaw root. It is a brownish powder, best given in form of pill, 1–4 grs., and is recommended as a diuretic, emmenagogue and parturient. It has been given with some success as an anthelmintic. Hale finds that the root produces a condition of the joints of the feet and hands like rheumatism. He tried it in rheumatism and found it beneficial. He states that it prevented *abortion*, and was valuable in *dysmenorrhæa*. Notwithstanding these reports the drug is falling into disrepute.

Cedron—Simaba Cedron seeds have been long employed by the natives of New Granada as a febrifuge and antidote to *bites of venomous animals*. They contain a bitter principle which appears to have antiperiodic powers like quinine. The powdered seeds in 5 gr. doses have been given in *ague*, *dysentery*, *cholera*, and *facial neuralgia*, and have been employed in *gout*, and in smaller doses in *atonic dyspepsia*.

Cerasin is an extractive existing in the form of a brown aromatic powder, prepared by evaporating a strong tincture of *Prunus Virginiana*. It is also known as Prunin, and may be given in doses of 3 to 6 grs. (See *Prunus Virginiana*.)

Ceresin is the name given to a firm white hydrocarbon, which is prepared from ozokerit. It is recommended as a basis for ointments and cerates.

Chaulmoogra Oil is the solid, yellowish oil expressed from the seeds of *Gynocardia odorata*. Its active principle, Gynocardic acid, is the most convenient form for the use of this drug. It may be given in doses commencing with 1 gr. three times a day, and may be pushed till 3 grs. three times a day are taken in capsules or pills. 5 grs. of the oil may be given in capsules. In India the oil is a fluid, but in this country it generally remains solid. It has been administered in *phthisis* without any success. The oil has been used, with some success, as an external application with friction to the chest and abdomen in *phthisis*, *tabes mesenterica*, and *struma*. It has been also tried in a similar manner rubbed into the skin over joints the seat of chronic *rheumatism* and *rheumatic arthritis*; also with some advantage in very *chronic eczema*, *leprosy*, *lupus*, and *psoriasis*. The best application in the various stages of *leprosy* is an ointment composed of one part of the oil with two of lard, though there is no evidence that this has cured the disease, it certainly, when used at the same time as the acid internally, does possess considerable power in retarding the progress of leprosy.

Checken—The leaves of *Myrtus Checken* contain a volatile oil and a volatile alkaloid combined with an organic acid. They have been found by Murrell, Dessauer, Holmes, and others to possess valuable expectorant qualities. Tangeman has used the fluid extract (1 in 1), and finds that in its elimination by the bronchial and renal surfaces decided diuretic and expectorant action occurs. The actual contact alters the relaxed condition of the vessels, and hence of the mucous membranes. He compares the action of checken to that of eucalyptus. He found in *chronic catarrhs* that it gave tone to the relaxed mucous membrane and made the breathing freer, especially in the case of old people. He gave $\frac{1}{2}$ to 1 dr. of the fluid extract every 5 hours. It has been used in *diphtheria*, *laryngitis*, *dysentery*, and in catarrhal conditions of the bladder; in Chili it is used in *rheumatism*.

Chenopodium Anthelminticum—(U.S.P.)—The seeds of this plant, known as American wormseed, have been used in America as a remedy for *round worm*, and, occasionally, for the tape worm. The oil in doses of 10 minims on sugar is a safe and certain anthelmintic for children. It has also been given in *chorea* and other spasmodic affections with doubtful success.

Chian Turpentine, about which so much has been written, is the semi-solid, oleo-resin, obtained by puncturing the trunk of *Pistacia Terebinthus*. It mainly derives its interest from the

reports of its marvellous powers in the treatment of *cancer* by Dr. Clay. After its introduction, numerous trials were made, and the almost unanimous verdict was that, as a curative agent, it had no power whatever in cancer, and the drug rapidly fell into disuse. Dr. Clay has again strongly insisted upon its virtues, and he quotes cases cured under its action. The writer has given it a fair trial in several cases and found no benefit whatever from it. It is insisted by those who believe in its efficacy that it must be given for a long time.

Chimaphila Umbellata leaves, under the name of Pipsissewa, are strongly recommended by Professor Wood in external *scrofula*. After extensive use he believes that this remedy comes near to cod-liver oil and iodine; his opinion is supported by that of many others who state that it is not only an astringent but a valuable alterative and tonic; its use must be persisted in. It has an action on the bladder like *Uva Ursi*, and has been used extensively on the Continent in *dropsy*, *albuminuria*, *cystitis*, and *gleet*, in doses of 1 dr. of the liquid extract (1 in 1) or 2 oz. of the decoction (U.S.P.).

Chininum Amorphum Boricum is a preparation of quinine introduced by Finkler and Prior. It is an amber-coloured crystalline powder, with a faint unobjectionable odour and bitter taste, and it is soluble in an equal quantity of water. They find that this preparation is much better borne than any other compound of quinine, even patients with irritable stomachs being able to take it without vomiting. Its action is equally satisfactory, having been administered with success in *typhus*, *typhoid*, *erysipelas*, *pneumonia*, *phthisis*, and with marked success in *neuralgia*. It causes less ringing in the ears than quinine. Schuabach recommends it upon this account as less likely to cause congestion of the tympanum. It is equal in therapeutic power to the sulphate or hydrochlorate of quinine.

Chinolinum is an oily liquid derived from quinine or cinchonine, it may also be obtained from coal tar derivatives. It is artificially prepared by heating nitro-benzol, aniline, and glycerine, with strong sulphuric acid. It is a powerful antiseptic and, before the discovery of antipyrine and antifebrin, was tried on the Continent in *typhus*, *pneumonia*, *diphtheria*, *enteric* and other *fevers*, with varying success as an antipyretic. Its smell, taste, and irritating qualities are barriers to its use. Siefert has obtained success with it painted upon the affected parts in *diphtheria* (5 per cent. solution in weak alcohol). The Tartrate is soluble, and may be given in doses of 5 to 20 grs. in water, in *ague* and *neuralgia*. The salicylate may be used in similar doses. These salts have been used locally in dilute solutions (1 in 100) as antiseptics in *gonorrhœa* and other affections.

Chloralamide, or Chloral Formamide, is a new hypnotic in colourless crystals, which are slightly bitter, soluble in water, and incompatible with alkalis. It was introduced as a substitute for chloral hydrate, and it was claimed for it that it was more pleasant to take, and possessed no objectionable cardiac depressant action. Its hypnotic power is estimated as about $\frac{2}{3}$ that of chloral. Already its literature is extensive, and it has been submitted to very prolonged trial by Gordon, Malaceowsky, Schaffe, and a host of others, and upon the whole it cannot be said to have answered the expectations of those who first wrote about it. It has been given in doses ranging from 25 to 60 grs. dissolved in water. It acts with tolerable certainty in *simple insomnia*, but generally fails in moderate doses when pain and excitement are present.

Robinson and Fürbringer report that it failed in nearly 50 per cent. of cases of insomnia, and they condemn it as uncertain. Hale White upon the other hand found it to be satisfactory in 18 out of 20 cases. Much of the discrepancy in the reports appears to be capable of the explanation that the drug is decomposed by the alkaline secretion of the intestines. It, is therefore, advisable to insure its complete solution in whiskey or brandy and *warm* water. It is stated that some specimens of the drug are very difficult to dissolve in water. It is demonstrated that the drug does produce some depressant action upon the heart, as Gordon and Malaceowsky found it lowered the blood pressure in large doses. The temperature is also lowered by large doses as in cases of chloral poisoning, and reflex action is diminished. In many instances sleep supervenes in 30 to 60 minutes, while sometimes, like sulphonal, it does not act for many hours.

It is stated that it does not tend to form a habit like chloral, but this statement is probably premature. Charteris has obtained good effects from it in *sea-sickness*, and it has been used in *whooping-cough*, *chorea*, *epilepsy*, &c. Upon the whole it would appear that therapeutics would not have seriously suffered had the drug never been introduced. It cannot be said to be superior to paraldehyde or sulphonal. The writer believes that it may be regarded as a diluted chloral, and regards it as possessing all the virtues and vices of that drug. Several observers have reported headache and gastric derangements after its administration.

Chloralimide is a still newer hypnotic, differing in chemical constitution from Chloralamide. It is prepared by the action of heat upon chloral ammonium. It exists in colourless, tasteless, odourless crystals, insoluble in water but soluble in spirit. It is stable, and is reported to be more efficacious than chloral or chloralamide, but sufficient information is not yet forthcoming. Choay claims for it properties which these substances are devoid of in safe doses, thus he states that in doses of 5 to 8 grs. it is analgesic and antipyretic to a remarkable degree.

Chloral Antipyrine.--See Hypnal.

Chloral Urethane.--See Somnal.

Chloroform Ammoniatum is a mixture of equal quantities of strong solution of ammonia in alcohol and chloroform, recommended by Richardson. 2 drs. put into an inhaler and breathed till chloroform narcosis is reached, may be inhaled without danger for a considerable period. In this way the temperature has been reduced 4° during 12 hours. It is thus antipyretic, anodyne, and anæsthetic, and maintains the alkalinity of the blood. He recommends its use in *acute rheumatism*.

Cobalto-nitrite of Potassium, upon the suggestion of Gibbs, has been used by Roosevelt; it is prepared by adding an acidulated solution of a cobalt salt to a solution of nitrite of potassium. The resulting salt is more stable, less soluble, and more uniform and purer than the other nitrites. Given in doses of $\frac{1}{2}$ gr. every two hours it acts like nitro-glycerine (page 436), and may be given in every case where it or nitrite of Amyl is indicated, viz: *angina pectoris*, *uræmia*, high arterial tension from whatever cause, and in *asthma*. The action of the drug is apparent in 30 minutes after its administration, and it lasts for 3 hours.

Cocculus Indicus, or *Menispermum Cocculus*—The dried fruit of this plant is a powerful narcotic, and has been long used to catch fish and game, and to add to the intoxicating powers of porter. The neutral crystalline principle known by the name of Picrotoxin is used for the night-sweats of *phthisis*. See its action and use on page 452.

Cocillana Bark is a Bolivian remedy, introduced by Rusby, of New York. He has satisfied himself of its great value in bronchial affections, where it renders the sputum less adhesive thus facilitating expectoration and diminishing coughing.

It contains a powerful principle like emetine, and promises to be of value as an expectorant. There are no accurate data for a correct dose, but 10 grs. of the powdered bark may be safely given every 4 or 6 hours.

Cocoa-Nut has recently been extolled as an anthelmintic by Parisi, who finds that the milk and interior of one nut, if eaten early in the morning whilst fasting, will lead to the expulsion of the tape-worm if present. Purgatives are unnecessary. The remedy certainly should have a trial in every case.

Colchicine and Coniine are the active principles of colchicum and conium suitable for hypodermic injection when the actions of these drugs are indicated, the former in $\frac{1}{32}$ gr. doses in

painful joint affections, chronic rheumatism, and gouty troubles; the latter in $\frac{1}{2}$ minim doses in *acute mania*. Success is reported in *tetanus* by Demme with hourly injections of $\frac{1}{10}$ gr. of Coniine bromide. (See in Therapeutic Section, under *Colchicum* and *Conium*.)

Collinsonia Canadensis, known as stone or knob root, has been used in America for a host of ailments, though practically nothing is known of its physiological action beyond that it acts as a local and possibly a remote astringent. Shoemaker brought a long list of diseases in which he had tried it successfully, before the late International Congress. The dose of the root is from 15 to 60 grs.; fluid extract (1 in 1), 15 to 60 minims.

It is a sedative to the urinary mucous membrane in obstinate *gonorrhœa*, *gleet*, and in *cystitis*, and has been proved valuable in *hæmorrhoids* and in *anal spasm*. As an antispasmodic, it has been used in *whooping-cough*, *chorea*, and *cardiac palpitation*. Externally it is used for wounds and bruises like *arnica*, but it is free from the serious objections to which *arnica* is open.

Colloid Styptic (Richardson)—Prepared by dissolving a saturated solution of tannin and gun cotton in absolute alcohol and ether, and adding a few drops of tincture of benzoin.

The solution is a most valuable styptic applied to wounds with a brush or in the form of a spray.

Condurango Bark was introduced by Friedreich for *cancer of the stomach*, and surprising results have been reported by Riess. 30 grs. may be given 4 or 5 times daily, and he affirms that the disease was always relieved, digestion improved, and pain disappeared, and that in no case did the tumour increase, but sometimes disappeared entirely. He found that weight generally increased. He gives a decoction (1 in 20) with syr. aurantii, of which 6 ozs. should be taken daily. There is no doubt that the drug is a valuable gastric sedative, and excellent results have been obtained from its use in gastric ulcer and other structural affections. It is hardly necessary to say that no one believes that it has the power to cure cancer of the stomach. Tchelzew has experimented with the drug on dogs, and found that in *fasting* animals it increased the gastric, pancreatic, and biliary secretions, chiefly the pancreatic.

Convallaria Majalis, or Lily of the Valley, has been long in use by the peasants in Russia, for dropsies. It has been found to possess powers closely resembling *digitalis*, and it is stated that it possesses none of the objectionable qualities which render *digitalis* sometimes dangerous.

It has a very decided tonic influence in moderate doses over a weakened heart, and it is a powerful diuretic.

It contains two glucosides—one, *convallarin*, is a drastic purgative in large doses; the other, *convallamarin*, is an emetic in even small doses. The most active preparation of the drug is an extract made from one part of the root and leaves, and three parts of the flowers and stalks; this may be given in 5 gr. doses, but the most uniform action is obtained from convallamarin, which is a whitish powder, and may be given in doses of $\frac{1}{2}$ to 2 grs.

One grain of the dried flowers, infused in 1 oz. water, and given every four hours, is a convenient method for administration.

Numerous observers have found that when given in cases of *valvular disease*, with cardiac failure, decidedly beneficial results follow; dyspnoea and palpitation disappear, and the action of the drug is maintained for a week after its use has been suspended. Under its use the pulse becomes more regular, fuller, and somewhat slower, the urine increases in amount, and dropsy diminishes, and continues to diminish for some days after the administration is stopped.

Ott believes it differs in its action from digitalis, by *primarily* increasing the frequency of the heart, and by afterwards slowing it, through its action on its muscular tissue.

Sansom is convinced of its power of raising the intravascular pressure, and of its increasing the force of systole, but is not yet convinced of its superiority to digitalis.

Coto Bark, and Paracoto Bark—The *true* Coto bark resembles the *false* or Paracoto bark, but is much richer in resinous and extractive substances, and yields a more energetic alkaloid. Cotoine is the alkaloid of Coto bark, and Paracotoine of Paracoto bark. They are similar in action, but Cotoine is more powerful.

Albertoni found they increased the appetite, and in a marked manner increased the absorptive power of the intestinal surface by dilating the intestinal vessels.

Cotoine has proved very valuable in the treatment of the *diarrhoea of children*. Good results have followed its use in the diarrhoea of *phthisis*, *teething*, *marasmus*, and *intestinal catarrh*, especially in the *feeble-minded* and *insane*, and in the *sweating* of phthisis, and it has been tried recently in *cholera* with marked success by Baelz, of Japan. It is not an astringent, and has but feeble antiseptic power, and Albertoni thinks it acts by increasing the intestinal absorption, the diminution of which is the cause of the diarrhoea. It is contra-indicated in hyperæmic states of the abdominal organs, or in hæmorrhage of the bowel, or in acute catarrhal conditions. Burney Yeo has tried it in *exophthalmic goitre*.

Dose of the bark, 5 grs.; of cotoine, $\frac{1}{2}$ to 2 grs.; of paracotoine, 1 to 3 grs., 4 or 6 times a day; and of the fluid extract, 5 minims.

Creolin is a dark-brown, syrupy liquid, smelling strongly of tar. It is prepared in the dry distillation of coal, and does not contain any carbolic acid. It is practically non-poisonous and non-irritating, forms an emulsion when mixed with water in small proportions, and is one of the most efficient antiseptics known. It has been used as a substitute for carbolic acid in gynæcology and operative surgery, and has answered the expectations of its first advocates. Jessner states that as a germ destroyer a 3 per cent. solution or emulsion is quite equal to a 5 per cent. carbolic acid solution.

This solution may be used for instruments and wounds, though 1 to 2 per cent. is generally found quite sufficient. In *dysentery* good results have been obtained by injecting a $\frac{1}{2}$ per cent. liquid to be retained for 30 minutes twice a day. The same strength has been successfully injected in *cystitis*, and applied to *burns*, *wounds*, and *bed-sores*. Half this strength (1 in 400) gives excellent results in *gonorrhœa* and *ozæna*.

It has been given internally in doses of 3 grs. (in pills) in *bronchitis*, *cystitis*, and *gonorrhœa*, and as an intestinal antiseptic in *enteritis*.

Cresalol, or Salicylate of Cresol, exists in the forms of ortho-, meta-, and para-cresalol, which are light, crystalline powders, insoluble in water; they are powerful antiseptics. The meta-salt is used as a surgical dressing in the form of insufflation or dusting powder. According to Widmer they are all three superior to iodoform, inasmuch as they are harmless and less objectionable in their odour, and have an astringent action upon the secreting surfaces to which they are applied. The para-salt has been given internally in *diarrhœa* and *typhoid fever* in doses of 3 to 8 grs. A gauze is used whose meshes are impregnated with this substance as a substitute for iodoform gauze.

Cresylol or **Cresol**, or Cresylic Acid, is the active principle of beech tar creasote; it is according to Adrian (*Petit Formulaire des Antiseptiques*) much more active as an antiseptic than carbolic acid (in the proportion of 4 to 1); and, at the same time, it is less toxic. It is insoluble in water, but dissolves in glycerine, alcohol, and ether, and can easily be made into a soap. It is introduced as a substitute for carbolic acid.

Curara, Wourara, Urari, or The South American Arrow Poison, is a dried extract, the product of various unknown plants. Strychnos and cocculus contribute to its terrible potency. Injected hypodermically or thrown direct into the blood stream, it produces profound muscular relaxation, with *slight* contractions, and if the dose be large enough, general muscular paralysis soon results and death follows from stoppage of the respiration. The heart's action persists to the end, and the nerve centres are un-

affected, the action of the poison "being upon the *terminations* of the nerves, not on their central origin." The sensorium remains clear till almost the end. Pollitzer, under Kühne, has found that curara does not paralyse the entire terminals of the nerves, and concludes that it acts upon the cementing substance at the nodes of Ranvier. When given by the mouth, the kidneys are able to excrete it so rapidly that a large dose may produce no effect. It has been used subcutaneously in *chorea*, $\frac{1}{15}$ gr.; in *hydrophobia* and *tetanus*; and, it has been stated, with some success in the latter diseases. It is of far greater interest to the pharmacologist and physiologist than to the therapist.

It is administered by hypodermic injection— $\frac{1}{4}$ to $\frac{1}{2}$ gr. dissolved in 4 to 8 minims of distilled water.

Cypripedium, *Cypripedium Pubescens*, and *Parviflorum*—known as Ladies' Slipper; the rhizomes of these orchidaceous plants have been found to possess antispasmodic and stimulating tonic properties, which have led to their administration in the group of diseases in which valerian has been found serviceable, *i.e.*, *hysteria*, *hypochondriasis*, &c. Paine has employed it as an antispasmodic in *chorea*, *epilepsy*, *spermatorrhœa*, and in *amenorrhœa*. There is an eclectic preparation in the form of a brownish powder, given in doses of 1 to 5 grs. in pill.

Cytisin—The nitrate of cytisin, which is the active principle of *Laburnum*, has been used hypodermically by Kraepelin in *migraine* associated with dilatation of the vessels. In a violent case where every known remedy had failed the hypodermic injection of .003 gramme gave immediate relief. It does harm where the migraine is associated with spasm, the remedy being a powerful vaso-constrictor. Cytisin also exists in *Arnica*. It cannot be given by the mouth owing to its dangerous irritant action on the stomach.

Damiana is the name given to a plant (*Turnera diffusa*) long used by the Mexicans as a powerful stimulant to the centres presiding over the reproductive functions. The leaves and flowers, with their young twigs, are the parts used in medicine as an aphrodisiac. It has been used in America with success in many forms of *brain exhaustion*, and want of tone in various regions of the nervous system, especially about the *genito-urinary centres*. It is a mild purgative, and has been given in some cases of *paralysis* with apparent benefit, and in *sick headaches*. The writer has obtained good results from it in cases of *sexual debility* and *hypochondriasis*. It is a tonic; in its action upon the appetite and mucous membrane of the stomach it resembles quinine and calumba, and it acts also as a stimulating diuretic.

Dose—1 oz. of an infusion representing $\frac{1}{2}$ to 1 dr. of the leaves three times a day; or 1 dr. of the fluid extract (1 in 1).

Datura Tatula is a solanaceous plant, resembling in most respects stramonium, with which it appears to agree in physiological and therapeutic action. It has been introduced as a remedy for *asthma*, to be smoked like stramonium, and though it may not be generally found to be more certain than this plant in its usefulness, yet the writer has seen it give most unmistakable relief when stramonium had completely failed, after many trials; and in this case it *continued* to give relief for years.

Daturia, or Daturine, is an alkaloid obtained from stramonium and datura tatula.

The researches of Ladenburg may be said to have cleared up the chemistry of the alkaloids which dilate the pupil. He has proved the identity of Daturine with Hyoscyamine and Duboisine. These alkaloids are almost identical in their relations, and are isomeric with atropine, so that *practically* the physician may regard these four alkaloids as one and the same remedy. They all produce dilatation of the pupil, increase the pulse and respiration rate, and cause delirium. (See Belladonna and Hyoscine.)

Dose— $\frac{1}{120}$ to $\frac{1}{60}$ gr.; it may be increased to $\frac{1}{30}$ gr. in solution with a few drops of weak acid.

Deelinæ Oleum—manufactured, as its name implies, on the banks of the river Dee—is a very highly refined petroleum oil, and has been very extensively tested by Dr. Roberts, who has found it clean, inodorous, and not easily made rancid.

He obtained good results in *gouty eczema*, ordinary *chronic eczema*, and also in the *acute general* variety. It is especially valuable for eczema of the *anus*, *perinæum*, and *labium*, *intertrigo*, *pityriasis capitis*, and *impetigo* of the scalp in children. After the acute stage is over it can be mixed with chloroform, oleate of zinc, &c., and can be made the basis for almost any other cutaneous remedy.

Delphine—The Alkaloid of Stavesacre has been given in $\frac{1}{2}$ gr. doses in pill in *asthma*, *rheumatism*, &c., and externally applied in the form of ointment over the course of neuralgic nerves. See page 491, under Staphisagria in the Therapeutic Section. The Delphinium consolida, or Knight's spur, is an old Russian remedy for *scrofula*, and has been recently re-introduced by Krasnogladdoff.

Dermatol is a fine yellow powder without odour, being non-poisonous and perfectly unirritating, and possessing astringent and antiseptic properties. It is a basic gallate of bismuth introduced by Heinz and Liebrecht. The reports of the value of this agent when used as a dry dressing instead of iodoform are surprising. *Ulcers*, *burns*, and *fresh wounds* heal with great rapidity, and its drying up properties have proved most valuable

in weeping *eczemas* and *intertrigo*. It may be used as a dry powder, collodion, paste, ointment, or glue. It has been given internally in *gastric ulcer* and *cancer*.

Digitalin—The Digitalinum of the late B.P. was wisely omitted from the 1885 volume. It was most variable, dangerous, and uncertain in its action. It is evident that it did not represent the active principle of the drug, since digitalis contains at least three active glucosides with different actions. The official or Galenical preparations should invariably be used in medicine, as the isolation of these active principles is as yet, even in the hands of the ablest chemists, surrounded with great difficulties. (See Digitalis, page 399.)

Dioscorea Villosa, or Wild Yam or Colic Root, has been found to possess marked cholagogue powers, and in America has been prized as a remedy for *gall-stones* and *biliary colic*. Little is known about its method of acting. Shoemaker states that it quickly relieves pain and spasm, and if the calculi be not of extreme size it leads to their prompt expulsion. It has been used in chronic *malaria*, *gastritis*, and *cirrhosis of the liver*, and is believed to increase the analgesic effect of opium in *hepatic cancer* and *renal colic*.

The dose is 15 to 20 drops of the fluid extract.

Diuretin is a sodio-salicylic compound of theobromine, corresponding to the soluble caffeine salts. Theobromine has been proved to act as a powerful diuretic, but as it is almost insoluble the new compound is introduced to get rid of that difficulty. It contains 48 or 50 per cent. of theobromine, and is very soluble in water. Considering the great uncertainty and irregularity noticeable in the action of diuretics the introduction of this drug is a gain, though doubtless reports of its failure must be expected. It must be given in doses of 15 grains at least four times a day in order to obtain its best effects. It has been given successfully in *all forms of dropsy*. Its value depends upon its stimulating power over the renal epithelium, and at first it was said to be contra-indicated in kidney disease, but numerous reports of its safety and efficiency have been forthcoming in both chronic and acute *Bright's disease*, the quality of urine being markedly increased without any untoward symptoms. It has no action upon the nervous system, and has often succeeded where caffeine and digitalis have failed, and its action is more lasting. It is stated that it may possibly produce collapse by removing the dropsy too rapidly. It acts well in *cardiac dropsy*, but is of less use in the dropsy following hepatic congestion and serous inflammations. It is best given in warm water.

Duboisia Myoporoides is an Australian solanaceous plant, yielding duboisine, an alkaloid found to resemble atropine closely in its physiological effects. Later research has proved it to be *isomeric* with that body, and to be *identical* with daturine and hyoscyamine. It is used in ophthalmic surgery as a substitute for atropine, than which it is said to act more promptly. 1 or 2 grs. of the sulphate to 1 oz. distilled water, or an aqueous solution of the extract may be used. Strong solutions (4 grs. to 1 oz.) when dropped into the eye have been reported in a few cases to cause faintness, giddiness, hallucinations, and collapse. (See Hyoscine and Belladonna.) It may be given in *mania*, like the other mydriatics, in $\frac{1}{40}$ gr. doses. Recently Ostermayer has obtained excellent results from the sulphate of this alkaloid as an hypnotic. He states that it is superior to hyoscine, and that it induces sleep in from a quarter to half an hour in doses of $\frac{1}{70}$ to $\frac{1}{25}$ grain.

Easton's Syrup—Syrupus Ferri Phosphatis c. Quinina et Strychnina is a valuable tonic, and possesses the virtues of the various ingredients contained in it in a presentable form. According to Squire, each drachm should contain about 1 gr. phosphate of iron and 1 gr. phosphate of quinine and $\frac{1}{32}$ gr. phosphate of strychnine. Davis and Schmidt show that the commercial article fluctuates very much in strength. The dose is one fluid drachm. The B.P.C. formula contains only $\frac{3}{4}$ gr. phosphate of quinine in each drachm.

Embelia Ribes is an efficient remedy for *tape-worm*. The fruit powdered in doses of 1 to 4 drs. in milk has proved very efficacious in destroying the parasite, if taken in the morning fasting. Dr. Dymock states that the fruit is exported in large quantities to Germany, where it is used as the active principle of several patent tape-worm cures. An acid named Embelic acid has been obtained from the fruit, it forms soluble salts with alkalies. The ammonium salt has been found highly efficacious in 6 gr. doses to adults. It is tasteless, and if followed by castor oil acts as a most satisfactory agent in destroying the tape-worm.

Emetia (Emetine)—A yellowish-white alkaloid, obtained from ipecacuanha. It is a powerful poison in large doses; in small doses, $\frac{1}{4}$ gr., it produces vomiting, whether injected into the subcutaneous tissue or swallowed. It does not act so speedily when injected. In either case it is eliminated by the liver, and gastro-intestinal tract. It causes vomiting through reflex action, by irritating the *endings* of the pneumogastric nerve in the stomach when swallowed or injected. It also acts by stimulating the centre which presides over the act of vomiting. The internal

temperature is raised, while the thermometer falls in the axilla under its use. (See *Ipecacuanha*.)

Dose as an expectorant, $\frac{1}{120}$ to $\frac{1}{40}$ gr. ; as an emetic, $\frac{1}{8}$ to $\frac{1}{4}$ gr.

Ephedrine is a new mydriatic, introduced by Nagai, who obtained it from the *Ephedra vulgaris* or steppe raspberry. It produces powerful depressing effect upon the heart and respiration, though it can safely be applied to the conjunctiva in 10 per cent. solution, where it causes dilatation of the pupil, with scarcely any interference with accommodation or intraocular pressure. Recently Bekhtin has given glowing accounts of the virtues of *Ephedra vulgaris* in *rheumatic affections*. He administered 5 grs. of the stem and root made into a decoction, in acute rheumatism, and he affirms that it is the best remedy yet known for this disease, reducing fever, joint affection, and cardiac complications in a few days. In chronic rheumatism its effects were valuable, but less striking.

The *Ephedra antisiphilitica* has a high reputation in *syphilis* and *gonorrhœa* in doses of 1 dr. of the fluid extract.

Eriodictyon Californicum, Yerba Santa, Consumptive Weed, or Holy Balm—The leaves of this hydrophyllaceous shrub have been used by the Spaniards on the Pacific Coast for many years as an expectorant, and have been found by Bundy to achieve some success in the treatment of *bronchial* and *laryngeal inflammations*. They contain an alterative mucilaginous principle which acts as a tonic to relaxed mucous membranes. Its virtues appear to have been greatly exaggerated. Stillé and Maisch state that "a bold ignorance has pronounced it to be a specific for chronic lung disease and a certain cure for consumption." Dose—1 dr. of the fluid extract (1 in 1).

Erythrophlœine—Lewin, in some experiments upon the arrow-poison known as Haya-poison, found it to possess, in addition to its poisonous properties, remarkable local anæsthetic qualities like cocaine. Further research suggested to him that the anæsthetic was the casca or sassy bark—*Erythrophlœum Guineense*, page 527). This proved to be correct, and, upon obtaining a sample of the alkaloid—Erythrophlœine—obtained from the bark, he found that it produced profound local anæsthesia which lasted for many hours, and sometimes for days. This alkaloid was described in former editions of this work, but its local powers were not suspected. It is a powerful heart poison, and must be used with caution. Its anæsthetic action, though deep, is very local and slow, and it causes some irritation at first, and subsequent observers have reported haziness of the cornea for a time after its use, and some deny its action ; thus Liebreich affirms that it only paralyses the sympathetic in the

eye, and that the real anæsthetic in the Haya-poison is the venom of a serpent. Schoeler, Koller (of cocaine fame), Karewski, Guttmann, and Goldschmidt corroborate Lewin's statements, particularly the last observer, who produced anæsthesia in the human eye by a few drops of a 1 in 1,000 solution, without alteration of vision, or of accommodation, or of pupil, though there was dilatation of the blood-vessels. There is no doubt we have in the drug a powerful and valuable local anæsthetic. Lewin uses the Hydrochlorate of Erythrophlœine 1 in 1,000. It has been given internally in *valvular disease* in doses of $\frac{1}{40}$ grain.

Eschscholtzia, or the well-known Californian Poppy, possesses some narcotic properties, and Bardet and Adrian have been able to extract minute quantities of morphine from it. Along the Pacific Coast it has been used as an anodyne, narcotic, and hypnotic instead of opium for children. It appears to act somewhat after the manner of lettuce.

Dose—30 grains to 2 drs. of the powdered plant.

Eseridin has been introduced as a substitute for eserine; it is prepared by the action of iodic acid upon physostigmine, and was supposed to be less toxic than eserine, a statement disproved by subsequent research. Schweber's experiments prove that it possesses no advantages over eserine.

Ether and Ethyl Hydrobromic, and Hydriodic.—See under *Æthyl*.

Ether Oxalic and Ether Methylic.—See under *Æther*.


Ethidene Dichloride, or Chlorinated Chloride of Ethyl $C_2H_4Cl_2$, is an anæsthetic which closely resembles chloroform in its physical characters. It was recommended by Snow, and has been made the subject of very careful experiments by a committee appointed by the British Medical Association. They reported that it was more dangerous than ether, but less so than chloroform. It is more pleasant than chloroform, and much less exciting in the early and after stages, and recovery from its influence is more rapid than in the case of ether or chloroform. The vapour of about $\frac{1}{2}$ oz. will, generally speaking, be found enough to produce anæsthesia in the adult. Recently, opacity of the cornea has been seen to follow its use owing to its power of dehydrating the corneal tissue. Much difference of opinion exists about the safety of this anæsthetic, and Ringer states that it affects the ventricle like chloroform, whilst others affirm the contrary. Many deaths have been reported from it, and notwithstanding the results of pharmacological experiments, the drug is probably decidedly more dangerous than chloroform and

ether when administered for the prevention of pain in surgical operations.

Ethylene Bichloride $C_2H_4Cl_2$ is isomeric with Ethidene Dichloride, with which, however, it should not be confounded. It is also known as Ethene Chloride or Dutch Liquid. It is capable of producing anæsthesia like chloroform and dichloride of ethidene, and probably is safer than either of these drugs, as it always acts in overdoses upon the respiration, and not upon the heart. The great objection to its use is the great irritation produced by the local action of its vapour upon the air passages.

It is a good local anæsthetic. Recent experiments have demonstrated that the opacity of the cornea resulting from its administration is not caused by actual contact, but occurs after the drug has gained admission to the blood.

Ethylene Bromide is a heavy, sweet liquid, with a chloroform-like odour, and containing about 91 per cent. of bromine. It is a powerful irritant, and should be used with caution. There is difficulty in its administration owing to its insolubility; it is best given with, at least, 4 times its bulk of almond oil in capsules. 3 minims appear to be a fair dose, though Donath states that it may be administered in many times this amount. It is reported by the last-named authority to give results in *epilepsy* far superior to those obtained by any other bromine preparation. The writer suspects it as possible that the liquid employed by Donath was not pure because of the magnitude of the dose which he used, *i.e.*, 70 drops or 35 minims. He gave it mixed with an equal quantity of spirit flavoured with peppermint in milk. His papers appeared in the *Pharmaceutische Post* and *Therapeutische Monatshefte* for June, 1891.

 Bromide of Ethylene should not be confounded with Bromide of Ethyl. (See page 508.)

Ethylenimine.—Syn. of Piperazine (which see.)

Eucalyptol is a colourless liquid prepared from the oil of eucalyptus (six different species), being that portion of the oil which passes over between 347° and 351° . It is used in all the conditions in which eucalyptus oil is indicated. Martindale points out that it is better than the crude oil for oro-nasal inhalers, because it does not dry up like a varnished coating. It is given internally in capsules containing 5 minims each, in *bronchial affections, cystitis, diarrhœa, asthma, &c.*

Eulyptol—Under this name has been recommended an antiseptic mixture or chemical combination, consisting of 1 part of carbolic acid, 1 part of oil of eucalyptus, and 6 parts of salicylic acid. It is used as an antiseptic in the various conditions in which its component parts have been indicated.

Eugenol, or Eugenic Acid, is, when pure, a colourless, oily liquid, smelling like cloves, obtained by oxidising oil of cloves with permanganate of potassium or chromic acid, or by acting upon cloves with strong alkali, distilling and adding H_2SO_4 to the residue. It is a powerful antiseptic, and is not toxic; it possesses antipyretic properties, and is a very valuable local anæsthetic in *neuralgia* and *toothache*. 15 grs. may be given in wine 3 times a day. It has been employed 10 grs. to 1 oz. lanoline in *pruritus*.

Eupatorium Perfoliatum, or Boneset U.S.P., is a valuable bitter tonic, like calumba, but it possesses diaphoretic properties. The warm infusion (1 oz. to 1 pint) in wine-glassful doses every two hours produces copious sweating; in 4 times this quantity it is an emetic, like warm chamomile infusion, and also a purgative. It has been used to act upon the skin in *bronchial catarrh*, *influenza*, and *muscular rheumatism*, and its cathartic action has been utilised for the expulsion of *tape* and *round worms*.

Euphorbium Pilulifera, or Pill-bearing spurge, paralyses the respiration and heart, through its direct action on the respiratory and cardiac centres. Marsset obtained good results with it in the dyspnœa of *asthma*, *emphysema*, and *bronchitis*; and Tison and Beaumetz in *dyspnœa of cardiac origin*. It appears to act beneficially upon *spasmodic dyspnœa*, from whatever cause arising, probably by its influence over the vagus, but its best effects are seen in ordinary *spasmodic asthma*; *coryza* and *hay asthma* have been markedly benefited by it. The gastric irritation arising from its administration can be avoided by giving the dose in a state of free dilution.

1 gr. of the extract or 4 to 6 grs. of the dried plant in decoction should be given 4 times a day, or 10-30 mins. of the B.P.C. tincture 1 in 5, freely diluted after meals.

Euphorin, or Phenyl-urethane, is an insoluble, colourless, crystalline powder, with a clove-like odour, prepared by the action of chlorocarbonic ether upon aniline. It has antipyretic, analgesic, antiseptic, and antirheumatic properties like salicylic acid and antifebrin, and has been used in about the same doses as antifebrin (8 grs.) in *fevers*, *neuralgia*, and *migraine*, &c. Sansom gave it in 20 to 30 grain *daily* doses in *acute rheumatism*, *sciatica*, *orchitis*, and other painful febrile affections, and applied the powder to *ulcers* and *chronic ophthalmia*. Its antipyretic action is prolonged, and accompanied with profuse perspiration, and free from the danger of cardiac collapse. 8 grs. are about equal in antipyretic effect to 16 grs. of antipyrine. It may be given in *tabloids* or dissolved in wine.

Euphrasia, or Eyebright, is a scrophulariaceous plant, containing tannin, and an acid which appears to exercise some astringent and alterative action upon the upper part of the respiratory tract. It has been extolled in *coryza*, bronchial affections of the larger tubes, *hay fever*, and *measles*. The tincture (2 oz. to 1 pint) may be given in doses of 10 or 15 minims every 3 hours.

Europhen, or Iodide of Isobutylorthocresol (not to be confounded with Euphorin), is a yellow bulky powder with a saffron-like odour, insoluble in water and soluble in alcohol. It is prepared by the action of iodine upon isobutylorthocresol. It is said to be harmless, having been given to dogs in doses of 45 grains without producing any inconvenience. Seibel and Eichhoff have used the powdered drug with success as a dressing to soft and indurated *chancres*, *lupus*, and *ulcers*. It is also administered as a hypodermic injection (15 minims of a 1 per cent. solution in olive oil) in secondary syphilitic affections. As an ointment (1 or 2 per cent.) it has been used in *psoriasis*, *eczema*, *ringworm*, &c., with advantage. It acts somewhat like iodoform and aristol when applied to moist and secreting surfaces, and it has been used as a gauze like iodoform dressing.

Exalgin, or Methylacetanilide, is a salt occurring in needle-like crystals, which are very sparingly soluble in water, and easily soluble in dilute alcohol. It is antiseptic, antipyretic, and analgesic. Its antiseptic properties are not utilised owing to its expensiveness; its antipyretic action does not become marked unless after doses which approach the toxic, hence the sphere of the drug is indicated by its name. It is used only for its pain-relieving qualities. Antipyrine and antifebrin are closely related to it in this respect, but it far surpasses them. In doses sufficient to obtain its full analgesic effect the drug does not produce the untoward symptoms sometimes seen after antipyrine and antifebrin. 5 grains will be generally found to relieve most cases of pain from whatever cause. Its best effects have been obtained in *neuralgia*, and it has been known to relieve patients in whom the other new analgesics had failed. Fraser found it to succeed in 48 cases out of 52, though his dose was small ($\frac{1}{2}$ to 2 grs.). The writer has failed very many times with this dose. 3 or 4 grs. 3 or 4 times a day will relieve almost all forms of *neuralgia*, *migraine*, *sciatica*, and every painful affection in which antipyrine has been successful. It diminishes the amount of urine and of sugar in *diabetes* as the other analgesics do, but its administration does not lead to any lasting results in this affection. The urine has been found to become almost black under its prolonged administration for neuralgia, but no harm resulted.

It may be administered in pill, but the best formula is that of Helbing, who dissolves 48 grs. in 12 drachms of tincture of orange peel, adding 1 oz. syrup of orange peel, and water to 6 ozs. The dose being one table-spoonful (4 grs).

Fabiana.—See Pichi.

Fellow's Syrup of the Hypophosphites presents the virtues of the hypophosphites of iron, quinine, strychnine, sodium, and manganese in the most elegant and efficient form. Each drachm contains, according to the formula of the makers:—Of hypophosphites of iron, 1 gr.; quinine, $\frac{3}{4}$ gr.; strychnine, $\frac{1}{64}$ gr.; calcium and manganese, of each, 1 gr.; potassium, q.s. The dose is 1 fluid drachm freely diluted. The original syrup is always uniform, and does not decompose or crystallise.

Franciscea Uniflora.—See Manaca.

Friedrichshall Water is a valuable aperient mineral water, and gives better results than any other as a constant saline purgative. Under the heading of *Magnesii Sulphas*, page 432, its action and uses are fully explained.

Fuchsine (Roseine or Magenta), as used in medicine, is the brilliant iridescent crystals of the hydrochlorate of rosaniline, recommended by Bouchut as a remedy for *albuminuria* with *œdema*. He published a series of cases in which the albumen entirely disappeared in children under doses of 1 to 3 grs. Since then innumerable failures appear to have been the rule, and the drug is rapidly passing into disuse; it colours the saliva and the urine red, and can only be given in pill as its watery solution stains the lips deep red, and it also affects the vision. Reiss, who affirms that the proper dose is $\frac{1}{64}$ to $\frac{1}{10}$ gr., reports 20 cases treated with these doses; all were greatly benefited, and he says in two the effects were truly wonderful. The result in these two cases probably might have been equally wonderful had the drug not been employed.

Fucus Vesiculosus, or Bladder Sea-weed, at one time enjoyed a position in the Irish Pharmacopœia. Its virtues have been chiefly found useful in *scrofula*, various *glandular* and *joint enlargements*, and *bronchocele*. D.-Duparc used it in *psoriasis*, and discovered that it caused the *absorption of adipose tissue*. Its pharmacology has yet to be worked out; some believe it causes emaciation by the amount of iodides which it contains, but iodine or iodides will not produce the results claimed for this wrack; others believe it to be uncertain or powerless, and it is rather a significant fact that the pig, which is regarded as closely allied to man in some physiological and structural points, has

been fattened for market on the *fucus vesiculosus* in the North of Ireland. An extract has been sold as a remedy for obesity under the title of "Anti-fat."

5 to 30 grs. of the extract, or 1 to 3 drs. of the fluid extract, may be given 3 times a day, though Shoemaker affirms that these are "irrational" preparations; he recommends a recent decoction.

Fuller's Earth—A clay or native silicate of alumina, containing minute quantities of iron. In the form of impalpable powder, it is a valuable emollient and "drying" remedy in *weeping eczema*, and especially in the *intertrigo* of infants. It resembles the oxide of zinc in its properties.

Galium Aparine, or Cleavers or Goose Grass, is a succulent annual plant which has been a domestic remedy for various *strumous disorders*, and the juice has been applied to disperse *glandular growths*, and to stop *hæmorrhages*. Prof. Quinlan finds by making a poultice of the chopped stalks and applying it to *chronic ulcers*, that "it acts as a slight stimulant and powerful promoter of healthy granulation." Dr. Boyce testifies to its value as a palliative in *cancer*. He gives 5 oz. of the juice daily, and applies a strong ointment to the ulcerated surface, which he afterwards covers over with a dressing of the bruised leaves.

Winn has found it to cure *psoriasis* after all other remedies failed, and Ogle recommends its administration in *epilepsy*.

Gaultheriæ Oleum—The fragrant oil of winter-green distilled from *Gaultheria* consists of salicylate of methyl to the extent of over 90 per cent. The oil of sweet birch has a similar composition. It has been administered as an antipyretic in *acute rheumatism*, in which disease its effects are identical with those produced by salicylic acid. It has a pleasant taste, and may be given in doses of 15 minims in emulsion or capsule every 3 or 4 hours. Its main usefulness lies in its being a source from which to obtain salicylic acid, and it is still a disputed point whether the acid derived from it is more efficacious than the artificial acid. The writer has administered both alternately and in many ways to test this point, and he is satisfied that where the *artificial* acid or its salts fail the natural acid and its salts will also fail. Since Charteris has demonstrated that the evil effects of the artificial salicylate depend upon an impurity which is easily removed, the natural acid or its salts will fall into disuse. Externally, diluted with equal parts of olive oil or soap liniment, it is an excellent topical anodyne application to inflamed and painful rheumatic joints.

Gelatines, Medicated—Professor Unna, to whom Skin Therapeutics owes so much, has marked an era by his medicated

gelatines. They can be used instead of greasy ointments. He makes a soft basis of—Gelatine, 3 ; oxide of zinc, 3 ; glycerine, 5, and water, 9 parts ; and a hard basis of—Oxide of zinc, 1 ; gelatine, glycerine, and water, of each, 3 parts. Either of these may be used in all cutaneous inflammations, *prurigo*, *eczema*, *acne*, &c., and to either, substances like resorcin (2 per cent.), ichthyol (2 per cent.), chrysarobin (5 to 10 per cent.), iodoform and sulphur (25 per cent.), may be added.

Pick, of Prague, dissolves clean white commercial gelatine in double its weight of water on a water-bath. The resulting solution brushed over the skin forms a protective coating, and has been used to form a basis for the application of chrysarobin, naphthol, iodoform, pyrogallie acid, and other active ingredients. Thus, for *psoriasis*, about 35 grs. of chrysarobin are added to 1 oz. of the hot gelatine solution, and stirred till thoroughly mixed. This when cold makes a cake which can be afterwards melted and applied with a brush to the diseased spots. The Sublimate gelatine used in the treatment of *scaly eczema* and other skin affections is an elegant and efficient agent. It is prepared by dissolving in a water-bath with water 30 parts of pure gelatine, and evaporating the mixture till its weight falls to 75 parts, at which point 25 parts glycerine and .05 perchloride of mercury are to be added. Auspitz uses a solution of gutta-percha in chloroform in a similar way. (See under Traumaticine.)

Gelosine—M. Guerin has introduced, under this name, a mucilaginous principle extracted from an alga of Japan, called *Gelidium corneum*. It is, according to Dr. Wilde, an excellent excipient for most pharmaceutical preparations, especially for suppositories, as it gradually contracts and expels the water and medicinal substances incorporated with it, which thus come in contact with the rectal walls. It is dissolved in its own weight of hot water, the active ingredients added, and then run into moulds.

Geranium Maculatum, or Cranesbill (U.S.P.)—The rhizome is an astringent, owing to the amount of gallic and tannic acids contained in it. It has been prized in America as a mild un-irritating astringent in the *diarrhæas* of *children* and *infants*. It can be used for all the purposes for which rhatany is employed, *i.e.*, as a local application in *anal* and *throat inflammations*, &c. It has been used with advantage as an injection in *leucorrhœa* and *gonorrhœa*, and recently Shoemaker has pointed out its great value as a hæmostatic in *hæmoptysis* and all other hæmorrhages, and externally as a styptic to *wounds* and *hæmorrhoids*. He finds a mixture of 1 part of the fluid extract, with 3 of water, gives good results in *anal fissure* and *metrorrhagia* and hæmorrhage from the

urethra and in *gleet*. The dose of the U.S.P. liquid extract (1 in 1) is $\frac{1}{2}$ to 1 dr. three or four times a day.

Glutinopeptonate of Corrosive Sublimate is introduced by Hufler, who has successfully used it in *syphilis* hypodermically in 1,300 injections.

It consists of soluble, silky scales prepared by treating gluten with hydrochloric acid and adding bichloride of mercury, 25 per cent. 4 grammes of the salt are dissolved in 100 cubic centimetres of water, making a 1 per cent. (Hg.) solution, and each Pravaz syringe contains one daily dose of sublimate. The injections can hardly be said to be painful, and only in 8 cases were relapses noticed, and these occurred in patients who had not taken the usual number (20 syringefuls). Four week's treatment will remove, it is said, all chance of relapse. Abscesses never occur, and only in a few cases have slight indurations at the site of puncture been observed.

Gossypii Radicis Cortex (U.S.P.)—Cotton-root Bark has been extensively used in America as a substitute for ergot. Prochownick, who recommends a fresh infusion in preference to the liquid extract (1 in 1), has employed it in *uterine hæmorrhage caused by abortion*, or *fibroid tumours*. He administers 1 dr. of the bark infused in 5 ozs. boiling water for 8 minutes, during the first and second stages of labour in cases where ergot is indicated. He believes he has witnessed uterine fibroids diminish in size under its use. It is a perfectly safe drug, though not so rapid or reliable in its action as ergot; 1 to 2 tea-spoonful doses of the liquid extract may be given in *dysmenorrhæa* and *amenorrhæa*.

Grindelia Robusta—The leaves and flowering tops have been used in America with advantage for spasmodic affections of the *respiratory passages*, chiefly for *asthma* and *whooping-cough*. It has a balsamic odour and persistent acrid taste, and the decoction is an expectorant. In large doses it has a sedative action on the respiratory centre, whilst it stimulates the brain and cord; in still larger doses it produces sleep and incomplete paralysis of the limbs. The oleo-resin which it contains is excreted by the kidney, and in its passage out acts as a diuretic. The volatile oil is excreted by the bronchial membrane, and hence the action of the drug in *bronchitis*, *emphysema*, *bronchorrhæa*, &c. It has been found to control *cystitis* and *iritis* in full doses, and its local application as an injection in *leucorrhæa* and *urethritis*, and as a dressing for *burns* and *ulcers*, has been praised. The leaves may be mixed with nitre and burned for the relief of *asthma*.

Dose—Of the fluid alcoholic extract (1 in 1), 10 to 30 minims; of the pilular extract, 1 to 3 grs., in bronchitis and asthma.

Grindelia squarrosa (an allied species) has been found to possess decided antiperiodic properties that have led to its use in *neuralgia*, and especially in *ague*, *enlarged spleen*, and various forms of *chronic malaria*. It has also given most valuable results in asthma.

Guaiacol—Sahli has introduced this colourless liquid as a substitute for creasote in the treatment of *phthisis*. It is the active constituent of creasote, and exists in beech-wood creasote to the extent of nearly 90 per cent. Chemically speaking it is the monomethyl ether of catechol or pyrocatechin. It has been demonstrated to possess powerful lethal action over the bacilli of tubercle by Guttman, even when in exceedingly weak solutions. Leech, Horner, Schüller, and others report of its effects in diminishing cough, sweating, and fever, and increasing the appetite. Horner has used it for several years in hospital practice, and has seen early cases cured by it. It is less disagreeable than creasote in taste, and may be given in 1 to 3 minims in pill or capsule, or dissolved in spirituous tinctures. The recent reports upon the value of this drug have justified Sahli's forecasts, and it is generally much better borne than creasote. It can be given in solution 1 dr. with 2 oz. tincture of orange, and 2 oz. glycerine, and water to 10 ozs. Dose—1 dessert-spoonful; but the capsule form is decidedly preferable. It may be used in carrying out the intensive method of treating phthisis with creasote, and 5 minims three times a day have been given without bad results.

Guaiacol-Benzoyl, or Benzosol, exists as colourless, odourless, tasteless crystals which are insoluble in water. It has been used by Bongart as a substitute for guaiacol on account of the facility with which it can be administered to patients who cannot tolerate creasote or guaiacol. It is given in the same doses. (It has been already mentioned under Benzosol.)

Guarana is a dried paste, in hard sticks or subglobular cakes, of a chocolate colour, prepared from the crushed or ground seeds of *Paullinia sorbilis*, a climbing, shrubby vine from Brazil. The alkaloid, of which it contains about 5 per cent., is identical with caffeine and theine, and is useful in *sick headache* in similar doses—1–5 grs.

Guaycurru, or Baycurru is a plumbaginous plant from Brazil, which has been found by Molina to be the most powerful vegetable astringent in *dysentery*, and when applied externally to all *atonic ulcers*. The dose is 1 oz. of a (1 in 1,000) decoction of the root.

Gurjun Balsam, or Balsam *Dipterocarpi*, or Wood Oil, has been used in India as a substitute for copaiba, to which it bears

a strong resemblance, but it is inferior in every respect as a diuretic; it does not, however, produce an eruption. Good results have followed its use in *leprosy*, when used as a local application, and given internally in 2 dr. doses at the same time, in emulsion 1 part, with 3 of lime water. Its local application (1 to 6 of lime water) is a good remedy in *chronic eczema*. In leprosy, lint may be soaked in a mixture of equal parts of the balsam and lime water, and applied to the ulcerated regions.

Gynocardia Odorata.—See Chaulmoogra Oil.

Hæmoglobin, extracted from the pure blood of the ox, is administered by Ziemssen in the form of a large pill or bolus coated over with chocolate and weighing over half a drachm. Two such pills are given three times a day, and are so easily assimilated and so absolutely free from insoluble or irritating ingredients that they have already given good results in *chlorosis* and in various forms of *anæmia*, though the actual amount of iron in each pill is perhaps not more than $\frac{1}{45}$ of a grain.

Vachetta has urged the use of Albuminate of Iron, for which he claims somewhat similar advantages. He administers it in grave cases of *anæmia* in doses of 5 to 15 grs. every 6 or 8 hours, and has obtained striking results by injecting a 10 or 20 per cent. aqueous solution hypodermically, or into the peritoneal cavity, no evil effects ever following its use; the hæmoglobin of the blood is rapidly increased, and the hæmopoietic organs are stimulated. Gempt and Biel use a solution of iron albuminate, which contains 5 per cent. oxide of iron. It may be given in *gastric ulcer* in 1 dr. doses and mixes well with milk. 1 oz. dried egg albumen and 6 oz. cold water are added to 160 minims of liq. ferri sesquichlor., 1½ oz. glycerine, and 1½ oz. cinnamon water, and well shaken and filtered.

The formulæ for Dieterich's Liquor Ferri Albuminati and Liquor Ferri Peptonati will be found in Martindale, seventh edition, pages 199 and 200.

Succinate of iron has been prepared by Haussmann as a substitute for all the iron preparations. Buckler gives it with chloroform in biliary calculi, which he states are dissolved by it. It may be used in every disease in which iron is indicated. It is prepared by mixing hydrated peroxide of iron 5; succinic acid 3; citrate of potash 15; glycerine 15; and distilled water 120 parts. For calculi, 10 mins. chloroform and a tea-spoonful of the above may be given 4 to 6 times a day, after each meal.

Hæmol and Hæmogallol are dark-brown or black powders, prepared from blood. They are introduced as remedial agents in 5 to 10 grain doses in *anæmia* and *chlorosis*, given in pilular or tabloid form.

Halviva Angustifolia is a plant of the Gentian order, which is reported to possess bitter tonic properties more valuable than those of gentian, calumba, and quinine. Yeates Hunter has used it for years, with excellent results, in *intermittent fever*, where it gives better results than quinine, without any of its drawbacks, and it is a safe and invaluable prophylactic.

Hazeline.—See under Hamamelis, page 411.

Hedeoma, or Pennyroyal (U.S.P.)—The leaves and tops of *Hedeoma pulegioides* yield a volatile oil which has long been a domestic antispasmodic and carminative, like the oil of peppermint. It has a decided stimulating action upon the uterine functions, and has been for a long time administered to increase the scanty menstrual discharge or to establish the absent flow in *amenorrhœa* not depending upon organic disease. 5-10 minims will be found to be a full dose, and generally will produce marked *emmenagogue* action. It is used in America as a remedy against mosquitoes ; these troublesome pests dislike its odour.

Helenin is the active principle of *Inula Campana*, or *Inula Helenium* (Elecampane.) It has been recommended in *phthisis*, *bronchopneumonia*, *pertussis*, and *enteric affections*. Valenzuela states that it is a more powerful antiseptic than boracic, salicylic, or carbolic acids, and is unirritating. He used an injection (1 in 1,500) in cases of septicæmia from *retained placenta* "with horrible fetor," with striking results. In *ozæna* and *anthrax* it was equally satisfactory. Internally, when given in chest affections, it diminishes thoracic pain, cough, and expectoration. There are no symptoms of narcotism, and the appetite improves and feverishness is reduced. In the General Hospital at Madrid it has been very extensively employed, and with marked success, in the early stages of *tuberculosis*. Ferran has pronounced its action upon the *cholera bacillus* to be more destructive than any other agent. It has been given by Baeza in the *diarrhœa of infancy*, in doses of $\frac{1}{12}$ gr. in water, with syrup and mucilage, and to adults in doses of $\frac{1}{2}$ to 2 grs. It has been successfully employed as a local application in *diphtheria*. Notwithstanding the numerous glowing accounts about the drug it has made little headway during the last few years.

Helleborein is a glucoside existing in the Christmas rose—*Helleborus niger* (and not in *Veratrum Viride*). It has been found by Venturini to be a local anæsthetic more powerful than cocaine. $\frac{1}{100}$ gr. in solution dropped on the conjunctiva produces a complete anæsthesia of the cornea lasting for $\frac{1}{2}$ to 1 hour, without in any way interfering with the intraocular pressure. It

produces deep anæsthesia wherever injected, but owing to its profound depressing action upon the heart it cannot be injected with safety.

Hippocastanum.—See *Æsculus*.

Hoangnan—Under this name the *Strychnos gauthieriana* belonging to the Loganiaceæ has been long known to the natives of Tonquin as an alleged remedy for, and preventive against *hydrophobia*. The bark is used made into pills with alum and realgar, and $2\frac{1}{2}$ grs. of it administered in a spoonful of vinegar as soon as the symptoms of hydrophobia show themselves, and $1\frac{1}{6}$ grs. are afterwards given every 15 minutes till the full physiological action of the drug is manifested. This is known by spasmodic contraction of the muscles of the legs, hands, and feet, and nervous twitchings about the chin. Preventive treatment consists in $1\frac{1}{6}$ gr. of the bark given during the day after the inoculation with the poison of rabies, double this the second day, treble the third day, and so on until the physiological symptoms show themselves. The bark contains strychnine, and Shoemaker has tried it successfully in a large number of diseases. It improved the appetite and digestion, strengthened the heart, augmented the intestinal secretion and peristalsis, and markedly increased the secretions of the skin. He used it as a tonic in *dyspepsia*, *alcoholism*, *amaurosis*, *asthma*, *neuralgia*, *neurasthenia*, different forms of *paralysis*, and a host of *cutaneous* affections. He gave 5 to 30 minims of the fluid extract, with dilute hydrochloric acid and tincture of gentian.

Hydraceticin, or Acetylphenylhydrazin, is a white, inodorous, almost tasteless, crystalline powder, soluble in about 50 parts of water, prepared by heating together anhydrous acetic acid and phenylhydrazin. It was found by Guttman to possess remarkable antipyretic properties, and to possess powerful antirheumatic virtues. Its use is not free from serious danger; collapse, cyanosis, hæmoglobinuria, and jaundice having been observed after even small doses.

$\frac{1}{4}$ gr. is a fair dose, and $\frac{3}{4}$ gr. twice daily should not be exceeded.

There were glowing accounts of its success when applied as an ointment (10 per cent.) in *psoriasis*, but it has practically failed in this disease, and alarming symptoms have followed its application to large tracts of skin. Under no circumstances should the external or internal use of the agent be continued for many days. The drug will not achieve any success which cannot be more safely obtained by other agents.

Pyrodin is the name given to an impure hydraceticin, which has been administered in much larger doses than the pure drug. Dreschfeld has given it in *scarlatina*, *pneumonia*, *typhus*,

neuralgia, and *migraine*, in doses of 8 to 10 grs. Its administration is not free from serious danger.

Hydrangea Arborescens—The root of this saxifrage yields a crystalline glucoside called hydrangin, which has not yet been investigated. The root has long enjoyed a reputation as a specific in gravel and *urinary calculi* and various forms of *cystitis*. It may be given in drachm doses of the fluid extract 1 in 1.

Hydrargyri Benzoas has been recently extolled as an agent for hypodermic injection, being used by Stoukownikoff, Balzer, and others. The solution is unstable and must be prepared just before use, which is a serious drawback. It gives rise to no local trouble, though stomatitis has been reported. The following formula is used:—benzoate of mercury 5 grs., chloride of sodium $1\frac{1}{2}$ grs., water 10 drachms; the daily dose being one Pravaz syringeful. It should not be used in very fat persons. 15 to 50 injections are necessary. It is so rapidly absorbed and eliminated that there is little fear of accumulation, which is the great danger in injecting the oily mixtures of the insoluble mercury salts.

Hydrargyri Carbolas—Karl Shadek has introduced this salt of mercury, which he prepares by precipitating a solution of perchloride with carbolate of potash, the result being carbolate of mercury—a white tasteless powder, which he gives, in doses of $\frac{1}{8}$ gr. 4 times daily, in *syphilis*. It is especially indicated in syphilitic *psoriasis* and in tubercular and macular eruptions.

Hydrargyri Cyanidum is obtained by boiling red oxide of mercury with Prussian blue, filtering and evaporating till the colourless prismatic crystals form.

Stellder, of Sweden, has reported surprising results obtained by the use of this salt of mercury in *diphtheria*—1,400 cases showing a mortality of under 7 per cent. His formula is:—cyanide of mercury 1 gr., tincture of aconite $1\frac{1}{2}$ drs., honey 5 oz.; a tea-spoonful of which is given every 15, 30, or 60 minutes, according to age, and a gargle of 1 in 10,000 used at the same time. Lister uses a dressing of the double cyanide of mercury and zinc. Gauze impregnated with it has been prized by surgeons as a powerful unirritating application to fresh wounds. It contains 3 per cent by weight of the salt and is tinted with rosolane; before application it is moistened with ordinary carbolic lotion.

Hydrargyri Formamidum—The formamide of mercury was introduced by Liebreich as an antisymphilitic remedy. He believes it undergoes disintegration in the blood after hypodermic injection, mercury being set free. It does not precipitate

albumen or cause any irritation of the subcutaneous connective tissue. Kopp and Schmitt have tried the formamide with satisfaction. From half to a whole Pravaz syringeful of a 1 per cent aqueous solution is injected two or three times a day. The treatment of syphilis by this drug has not gained ground, and relapses have been very frequent. Scarenzio prefers the hypodermic administration of calomel in suspension, and Shoemaker injects $\frac{1}{10}$ gr. of the pure perchloride deeply into the tissues. It is claimed for the calomel that only 4 injections of 40 centigrammes in all is enough for ordinary cases of syphilis. The experience of all who have used mercury much, tends to prove that many months, and even years, must be spent before the poison of syphilis is eradicated by this or any other drug.

Bloxam in 600 injections used Sal Alembroth with great satisfaction. He injects 10 minims of the solution mentioned upon page 510 once a week till mercurialism occurs, then once a fortnight, and finally once a month for 18 to 23 months. The total quantity of mercury only amounting to 6 or 8 grains during the entire treatment. Galliot in 4,000 injections of $1\frac{1}{2}$ grs. yellow oxide in 15 minims of vaseline oil had no accidents. Lang used "Grey Oil," for which there are numerous formulæ. The best consists of a weak lanoline ointment of mercury, rubbed up with olive oil and made to contain 30 per cent. mercury. The dose is .2 to .3 c.cm. Leloir's grey oil contains 80 parts oil of vaseline, 10 of ethereal tincture of benzoin, and 40 pure mercury. (See also Hyd. Benzoas, and Succinimidum, &c.)

Hydrargyri Iodidum Viride.—See page 415.

Hydrargyri Perchloridi Glutinopeptonas.—See Glutinopeptonate of Corrosive Sublimate, page 548.

Hydrargyri Salicylas is a white insoluble powder without odour or taste, which has been extensively used for hypodermic injection and as a remedy for gonorrhœa. It is formed by mixing solutions of nitrate of mercury and salicylate of soda. It causes no pain, and is as powerful an antiseptic as corrosive sublimate. Its great drawback was its insolubility, but Vacher has overcome this by using the following formula for external application :—1 part corrosive sublimate, 2 parts salicylate soda, and 1,000 parts water. For internal use he injects one cubic centimetre (15 minims) of the following solution :—1 part sublimate, 3 salicylate of soda, 100 water. This dose contains .154 grs. salicylate of mercury.

Hydrargyri Succinimidum—Vollert highly recommends the succinimide of mercury for hypodermic use, as it does not precipitate albumen. It is a white shining powder, soluble in water, and does not cause any suppuration at the point of

injection. Wolff uses a Pravaz syringe of a 2 per cent. solution (1 per cent. Hg.), thus each injection equals nearly $\frac{1}{7}$ gr. mercury. He states that it is preferable to mercury glycocoll, and should be injected deeply in an oblique direction under the skin of the buttock into the subcutaneous fat, and the swelling stroked gently till dispersed; about 20 injections are the average number for ordinary cases. The right and left buttock are selected alternately.

Hydrargyri Tannas—This preparation introduced by Lustgarden as a remedy in syphilis—is a tannate of the protoxide of mercury, and contains 50 per cent. of the metal. It is a green, tasteless powder, which decomposes upon the addition of weak alkalies, setting free mercurial globules, and it is believed that such a decomposition takes place in the bowels, and the minute particles of mercury rapidly find their way into the blood. $1\frac{1}{2}$ grs. are administered 3 times a day. Kaposi has used it with benefit in many cases of syphilis. It does not produce any unpleasant after-consequences or disarrangement of the digestion.

Hydrargyri Thymolas is a white crystalline, inodorous, insoluble powder, prepared by mixing solutions of acetate of mercury and thymol. It is given internally ($\frac{1}{10}$ gr.) and used as an injection into the muscles in syphilis, the injections being stated to be nearly free from pain and the danger of abscesses. Vaseline oil is the usual menstruum.

Tranjen treated *pulmonary tuberculosis* by injecting into the muscles of the buttock this salt, every 9 days. He mixed 3 parts with 40 of liquid vaseline and injected 15 minims. The method has met with little support.

Hydrastine.—See under Hydrastis, page 417.

Hydrochinon or Hydroquinone ($C_6H_6O_2$) is a derivative of coal tar, and is isomeric with resorcin, and has been found to possess properties not inferior to quinine. It occurs in sweet, odourless, colourless crystals, and has been given in *typhoid* and *typhus fevers* and many other diseases where a high temperature has been recorded. Rostoshinsky and Traversa find it invariably reduces the fever temperature rapidly, a gramme dose causing a fall of 6 or more degrees. Its effects are more evanescent than quinine or antipyrine, a smart rigor generally issuing in a rise in 4 or 5 hours again. The respiration and pulse are lowered, and perspiration occurs. It is safe, and does not produce buzzing in the ears, headache, &c., and it can be given continuously in 5 gr. doses. It has been little used since the triumphs of antipyrine and antifebrin, but it possesses the advantage of giving little pain when injected hypodermically. It is also known as Quinol. The ordinary safe dose of 5 grs. should not be exceeded.

Hydrocotyle Asiatica, or Asiatic Pennywort—The leaves of this umbelliferous plant have been largely used for *leprosy* and *elephantiasis* in the East, and at home it has been considered a remedy of some power in *chronic syphilis and struma*, in pills containing 4 grs. each of the powdered leaves—2, three times a day.

Hydrogen Peroxide, or Hydroxyl, is a solution prepared by treating peroxide of barium with hydrochloric acid. It has been administered as a disinfectant and alterative, like iodine, in *glandular swellings*, on theoretical grounds, in *pertussis, scarlatina, diabetes, albuminuria*, and *fevers*, as an *antidote* to the alkaloids, and in *dyspnœa* and *rheumatism*, but with little results to encourage its use. Its local application to *purulent wounds, chancres*, and *sores* is attended with marked benefit. It is a powerful antiseptic and antiferment, destroying organised ferments with great avidity without having any effect upon diastase fermentations, and as a surgical dressing probably will win its way to a high place ultimately. Coming into contact with pus it causes effervescence by parting with its oxygen, which determines the death of the bacteria. Wile has obtained excellent results by injecting a 10 per cent. solution into the sac of abscesses after removing their contents. (See the Author's Dictionary of Treatment, page 14.) Gibier, by adding a few drops of a 1½ per cent. solution to the hydrophobic virus, found that it failed to communicate rabies when injected into healthy rabbits. A 1 in 8 solution has been proved to be of peculiar value as a disinfectant application to the middle ear to check chronic suppurative inflammations; and as a local application, for swabbing the throat in *diphtheria*, by Hatfield. It is the basis of the disinfectant known as Sanitas.

Dose—½ to 2 drs., largely diluted with water.

Hydronaphthol is a powerful disinfectant and antiseptic, which is believed to be free from all toxic properties; it is a derivative of B.-naphthol, but its exact chemical constitution is not definitely demonstrated. It has been used by Dockrell in *tinea* (10 per cent. plaster) with good results, and it has been given internally in *typhoid fever, diarrhœa*, and other similar conditions in 2 gr. doses. A saturated solution in cold water (½ gr. to 1 oz.) is a powerful antiseptic, free from objectionable qualities, and a solution (1½ grs. to 1 oz.) in *warm* water is a potent disinfectant for *foul* wounds. 5 grs. to 1 pint of ordinary spirit lotion is as efficacious in its action over disease germs as corrosive sublimate solutions.

It may be used as a dusting powder or as a gauze.

Hydroxylamine is an odourless, colourless body, being ammonia in which one atom of hydrogen is replaced by hydroxyl.

The hydrochlorate is the form in which it is always used. It is a salt resembling the chloride of ammonium, deliquescent and very soluble. It is a powerful reducing agent, and has been recommended as a substitute for chrysarobin, pyrogallic acid, and anthrarobin in *psoriasis*, *lupus*, and parasitic skin diseases when used as a 1 in 1,000 solution. The results are doubtful, and the agent is a powerful irritant, and when taken internally it is a dangerous poison.

Hygrinic Ether—The exact composition of this body is not clearly made out. It is a derivative of hygrine, according to Calmels, and its isolation and discovery have only been recently announced by Panas, who found that the cocaine obtained as a second extraction from the leaves of the cocoa caused a wide dilatation of the pupil. Further investigation resulted in the finding of this new mydriatic, which causes no anæsthesia, and whose dilating effects pass off quicker than those of atropine; they generally only last 24 hours.

Hygrophila Spinosa, or *Astercantha longifolia*, is a Ceylon shrub which has been introduced by Jayesingha, who has found that in divided doses 2 oz. of the dried plant infused in 20 oz. water have remarkable diuretic powers in *dropsy*. The seeds are aphrodisiac as well as diuretic, and have been locally used in *rheumatism*. The plant has been much used in India in *renal* and *hepatic dropsy*.

Hyoscine—Ladenburg has found that hyoscyamus contains two alkaloids. These have been investigated by Prof. Wood, and have been much used recently. There is, however, sad confusion in their nomenclature, actions, and doses. One alkaloid occurs in *crystals*, is *isomeric* with atropine, and *identical* with daturine and duboisine, this is the commercial Crystallized Hyoscyamine (Latin—Hyoscyamina), the sulphate of which is in the U.S.P. The dose formerly, when generally supplied impure, was 1 gr. Now it is sold pure, and such a dose would kill. Dose— $\frac{1}{100}$ to $\frac{1}{50}$ gr.

The second alkaloid is *amorphous*, existing in the *pure* state in the form of a syrupy liquid, though its salts are crystallizable. It was formerly known in commerce as Amorphous Hyoscyamine, now it is, on the authority of Ladenburg, only known as Hyoscine. It is isomeric with atropine and hyoscyamine, but differs widely in its chemical and therapeutic properties. Its dose is $\frac{1}{200}$ to $\frac{1}{100}$ gr., and for the present only Merck's preparations should be used. There are 3 salts—the hydriodate, hydrobromate, and hydrochlorate. Dose of each— $\frac{1}{150}$ gr.

The crystallized Hyoscyamine in its pharmacological properties closely resembles atropine, is believed to be somewhat hypnotic,

but it will probably cease to be used in medicine. Will has recently proved that this alkaloid can be obtained from belladonna root, and can be changed into atropine by continued heating.

Hyoscine and its salts have been thoroughly tested by many authorities, and found to be valuable hypnotics scarcely affecting the heart and vessels. In *mania*, *delirium tremens*, and in all cases of *insomnia* with mental excitement, a hypodermic injection gives quiet natural sleep, and $\frac{1}{100}$ gr. has produced no bad symptoms, but only half this amount should be given at first. The remedy has been successfully given in large lunatic asylums with most beneficial results. According to Krauss, after its administration the maniac collapses as if struck by lightning, but the calming down of the general paralytic is gradual, his restlessness soon settling down into peaceful slumber. The drug is not without its drawbacks, and though many observers assert that it has no influence upon the heart, nevertheless it is apparent that a remedy of such potency is not one to be employed in a routine way in the treatment of simple chronic insomnia. Some authorities have reported sharp, depressant effects from $\frac{1}{60}$ grain, and it will be wise to regard valvular disease as a contra-indication to its use. In insomnia associated with or depending upon a latent strain of insanity, Hyoscine is the most reliable weapon in our armoury. Erb has given it in *paralysis agitans* with remarkable relief in doses of only $\frac{1}{250}$ gr. Slight dilatation of the pupil and dryness of the throat, and even paralysis of the pharynx have been observed to follow. Tirard and Bruce report of its splendid results as an hypnotic in renal disease. Tirard injects 1 to 2 minims of a .5 per cent. solution.

Tweedy praises it as a mydriatic chiefly in *iritis*; it produces (1 in 200) wide dilatation, lasting for a long time. Webber gives the drug by the mouth in insomnia, in doses of 20 minims of a solution containing Hyoscine hydrobromate gr. i., Spt. V. Rect. 3iss., Aquæ ad 3xx.

Hypnal, or Chloral Antipyrine, is a crystalline body obtained by mixing strong solutions of chloral hydrate and antipyrine. At first pronounced to be inactive, this body was afterwards demonstrated to be a strong hypnotic. The difference of opinion still existing about its value may be explained by remembering that the body first obtained by Reuter consisted of a molecule of *anhydrous* chloral with a molecule of antipyrine. This body is inactive. Hypnal is almost tasteless, it has all the properties of chloral hydrate, and all its objectionable points, *i.e.*, it depresses the heart seriously, though in ordinary cases of *insomnia* it is an effective hypnotic in 20 gr. doses. It must not be given where the heart is affected. It is claimed for it that it has the analgesic

qualities of antipyrine, and therefore will induce sleep in the presence of pain.

Hypnone, or Acetophenone, is a strong smelling, colourless, volatile liquid, insoluble in water, prepared by the distillation of acetate and benzoate of lime. Most unfavourable reports of its value can be gleaned from the various medical journals, and there cannot be a doubt that it rapidly will cease to be used as a sleep producer. It possesses other properties which may prevent its disappearance from the field of therapeutics. Thus Pensato found it to be a powerful antiseptic, and has used it, with what he believes to be success, as an inhalation in phthisis—5 drops every four hours, in a mask inhaler. Cough and expectoration and temperature were very favourably influenced by it. He also gave it in capsules in doses of 5 minims, and found, contrary to the reports of most observers, that it produced sleep.

Hurt and Moebs report after exhaustive trials that the results are positively illusory in every case.

Hysteronica Baylahuen is a plant much used in Chili ; it contains large quantities of resin as well as an essential oil. It has been found of much service in *dysentery*, and in the obstinate *diarrhoea* of phthisis. The essential oil contained in the plant acts as an expectorant in pulmonary and bronchial affections, and the resinous material exercises its alterative and antiseptic properties upon the genito-urinary tract and upon the renal secretion. Shoemaker states that it increases the acidity of the urine ; this may possibly be explained by its power of preventing the formation of free ammonia in the bladder owing to its antiseptic action on the urine. Baillé praises the watery infusion (1 in 150). The alcoholic tincture (1 in 5) is said not to produce constipation ; it is given in doses of 20 minims in a little wine.

Ichthyol — Is a greenish-brown, oily substance, with a gaseous odour, containing about 10 per cent. of sulphur, obtained by the dry distillation of a bituminous rock in the Tyrol, which has been regarded geologically as being formed by decomposed animal matters, chiefly from fish. Unna, from a consideration of its tar-like nature and richness in sulphur, introduced it to the profession as a remedy for various *chronic skin diseases*. Since its introduction in 1882 this drug has been severely tested, and the results prove that it more than fulfils all that Professor Unna claimed for it. The medicinal ichthyol is the ichthyo-sulphate of sodium or ammonium, both of which are soluble in water and mix with glycerine, fats, and vaseline in all proportions. It is the ammonium salt which is generally

employed when ichthyol is prescribed. The large amount of combined sulphur contained in this substance affords the natural explanation of its therapeutic virtues. Charles points out that the sulphur is present partly in direct combination with the carbon, as in mercaptan, and partly in close combination with oxygen, rendering the whole soluble and absorbable. Very large amounts of sulphur can thus be easily introduced into the system by giving this drug by the mouth.

Nusbaum as well as Unna has studied its internal action. He finds it valuable in all diseases in which there is capillary engorgement, and after many years' use they testify to its power in a host of widely different ailments, as chronic *rheumatism*, *asthma*, *chlorosis*, *scrofula*, *phthisis*, *gout*, vesical, intestinal and gastric *catarrhs*, pelvic *neuralgia*, and neuralgia of bones, joints, and muscles, *metritis*, and uterine diseases. 2—5 pills, or capsules, morning and evening, each containing $1\frac{1}{2}$ grs., may be given in the above diseases, as well as in *eczema*, *lupus*, *acne*, &c. No harm has come of taking ten times this quantity; indeed it has been demonstrated that the drug is quite free from all toxic properties. Charles reports most satisfactory results from it in *catarrhal* affections of the nose, stomach, and bladder, and in *albuminuria* and *nephritis*. Kœster succeeded in *gonorrhœa* with a 1 per cent. injection, and it has been extolled as an injection in *cystitis* and diseases of the uterus and Fallopian tubes. Zuelzer believes it acts by preventing organic waste, through retarding the disintegration of albumens. Charles found by accurate observations upon the body weight that ichthyol increased it, and at the same time improved the general health. Externally, Lorenz uses a 1 to 70 vaseline ointment for *wounds* and *burns*, and apparently magical virtues are claimed for a 20 per cent. collodion, or a 50 per cent. ointment in *erysipelas*. Since it produces so little irritation it may be used in any strength of ointment from 1 to 30 per cent. in *eczema*, *acne*, *psoriasis*, *herpes*, *erythema*, *boils*, *carbuncles*, &c.

Ingluvin is a powder prepared from the gizzard of the common fowl, and it was introduced as a variety of pepsin to supplement the action of the gastric juice in *atonic dyspepsia*. It has been proved that ingluvin exerts a very feeble digestive action upon albuminous foods outside the body, nevertheless, in the vomiting of *pregnancy* it has earned for itself some reputation. It has been found more efficacious in the vomiting of *primiparæ*, especially if associated with anæmia; it should be given very early in the morning, and repeated every 4 hours in 10 to 20 gr. doses. It has been found useful occasionally in the *dyspepsia* and *flatulence* of *phthisis*.

Inula.—See Helenin.

Iodantipyrine, or Iodopyrine, is a colourless, tasteless, inodorous antiseptic, slightly soluble in cold, but freely soluble in warm water, prepared by mixing solutions of iodine and antipyrine. It has been demonstrated to possess most of the virtues of antipyrine, and has been used as an antipyretic in 15 to 20 grain doses. It is stated to reduce the temperature without collapse or rigors. Jaksh has employed it with success in *asthma*, and it has given excellent results in *subacute rheumatism*. It may be given in tabloids or wafer papers.

Iodated Phenol—Under this name Rosenfeld has used a solution of 4 grs. of iodine and 8 grs. carbolic acid in 10 drs. of glycerine. Of this mixture 1 to 2 tea-spoonfuls are administered to children in 5 oz. of water as an enema in *dysentery*, three or four times a day, with very good results.

Mixed in the proper proportions, carbolic acid bleaches iodine completely, and the resulting colourless liquid possesses all the virtues of both substances. (See page 423.)

Iodine Trichloride is a new antiseptic introduced by Langenbuch, and is a yellow powder prepared by acting on iodine with dry chlorine gas. It contains over 50 per cent. iodine. 1 dr. in 1 gallon water makes a solution which, when applied to wounds, gives off its chlorine readily, and acts as a powerful antiseptic and disinfectant without the dangers of carbolic acid, iodoform, or sublimate. He speaks most highly of its use in 100 amputations, and he gave $\frac{1}{2}$ oz. doses of the above solution every two hours with success in dyspeptic troubles arising from gastric fermentation.

Iodized Phenol is a dark, thick liquid, or semi-solid paste, prepared by rubbing at a gentle heat, iodine 1 oz. and pure carbolic acid 4 oz., till dissolved. It is a caustic and powerful alterative when applied to *uterine ulcerations*, and is the best local treatment for abrasions and granular conditions of the cervix. The writer has found that it prevents *buboes* when lightly painted over the inflamed glands. It is used with success in *ringworm* of the scalp and body.

Iodoformum Bituminatum is a substance prepared by Ehrmann by mixing tar and iodoform together. It has an agreeable odour, and possesses all the virtues of iodoform without the serious drawback of its penetrating and easily-recognised odour. It is employed in the powdered form like iodoform.

Iodol—This new antiseptic is a brown crystalline powder, containing nearly 90 per cent. of iodine, obtained by acting upon iodine with pyrrol. It is almost odourless, soluble in ether (1 in 1), and in water 1 in 5,000. It resembles iodoform in its

action in some particulars, and affects the system like iodide of potassium when taken internally, only that it is very slowly absorbed. 5 to 10 grs. may be given in pill or capsule where this latter salt is indicated. It has been used as a powder to *wounds, ulcers, and sores*, or as an ether (1 in 10), ointment (1 in 20), or as a paste made with a little spirit. Wolfenden and Lublinski laud it in tubercular *laryngitis* and *pharyngitis*. Upon the whole, iodol cannot be said to be gaining ground. Treves and others doubt its usefulness as a surgical dressing, though it is still used as a substitute for iodoform by many surgeons in almost every affection for which that drug has been employed.

Mazzoni's formula is—Iodol 1 dr., alcohol 2 oz., glycerine 4 oz.

Iodophenin is a brown, crystalline powder containing over 50 per cent. of iodine. It is prepared by the action of phenacetin upon iodine in the presence of acids, and has been described under the name of Iodophenacetin. It should not be used internally, but is a powerful antiseptic and germ destroyer, 1 in 5,000 speedily destroying bacteria.

Iodosulphate of Cinchonine.—See Antiseptol.

Ipomæa Cærulea has been used for its stimulating action upon the intestinal glandular apparatus. An extract prepared from the seeds in 5 to 10 gr. doses produces a copious, prompt, and painless evacuation, not liable to be followed by further purgation or astringency.

Iris, or Blue Flag (U.S.P.)—The rhizome and rootlets of *Iris versicolor* yield a fluid extract and eclectic preparation, in the form of a brown powder. This latter preparation, known as Iridin, is the one generally used. It acts as a powerful hepatic and intestinal stimulant, and closely resembles podophyllin in its effects. It is believed to possess alterative properties, which have given it a reputation as an antisiphilitic and antiscorbutic. It is a diuretic; and has been found to remove *jaundice of malarial origin*. 1½ to 3 grs. every night in the form of a pill, followed by a mild saline, have given good results in the *vomiting of pregnancy* and in *torpid liver*.

Jacaranda Lancifoliata—This plant has been used as a remedy for *venereal* diseases amongst the natives of Columbia, and Mr. Mennell has tried it with considerable success in *gonorrhæa* and *gleet*, which had resisted other treatments. He gave 15 minim doses of the tincture (2 oz. to 1 pint), and in obstinate gleet, injected 10 minims to 1 oz. water, which stopped the discharge rapidly. It has been used also with success in *psoriasis* and *rheumatism*, and it can be combined with iodides advantageously. Limousin gives the dose of the fluid extract as 15 to 60 minims three times a day.

Jambul, or *Syzygium Jambolana*—The seeds of this myrtaceous tree have been introduced by Bamatvala, and tried in *diabetes* by Fenwick, Saundby, Caldwell, and others, and in some cases with no result, whilst in others the remedy was beneficial to an unexpected extent. Dr. Kingsbury found in one case that the urine fell from $7\frac{1}{2}$ to $4\frac{1}{2}$ quarts, and Fenwick reports a case where, in one week, sloughing ulcers rapidly healed and the urine fell to one-half after $2\frac{1}{2}$ gr. powdered seeds three times a day. Double this amount may be given. It has been proved that the drug has a marked power in diminishing phloridzin diabetes in dogs. The fruit is used in India as an astringent in *dysentery* and *diarrhæa*.

Jatropha Curcas—The seeds of this Euphorbiaceous plant yield on expression an oil of rather pleasant flavour, which has been extensively tried in Southern America and India as a purgative. 15 minims of this fixed oil produce active purgation, said to be equal to about 1 oz. of castor oil. The great disadvantage possessed by castor oil is its bulkiness, which prevents its being administered in capsules. The oil of *jatropha*, if found otherwise unobjectionable, may prove of great convenience.

Jequirity Seeds (*Abrus Precatorius*)—Since the scarlet seeds known as "prayer beads and jumble beads" were introduced by Wecker for producing what is now known as Jequirity Ophthalmia much has been written upon them. Sattler using a $\frac{1}{2}$ to 1 per cent. active *fresh* infusion prepared by macerating the bruised seeds deprived of their coats, in cold water for 24 hours, filtering and applying at once to the conjunctiva, describes the application itself as painless. After three hours—the period of incubation—symptoms of severe ophthalmia begin, which reaches its height in about 30 hours. There is intense inflammation, pain, heat, redness, and œdema, with the development of a thick adherent croupous membrane, which separates from the conjunctiva about the third day, but which is reproduced at intervals for three days more. There is profuse purulent secretion, and generally some weeks elapse before the last traces of redness, unevenness, and dirty yellow discoloration pass off.

The infusion swarms with a peculiar microzyme, to which the effects of the drug have been attributed. This bacillus has been seen in the purulent secretion, and Sattler affirms that a little of the secretion will produce a conjunctivitis like the original, only much milder. He cultivated the bacillus through several generations. Bechamp and Dujardin have cultivated the bacillus, and upon injecting it into the veins found that it produced death like jequirity. Klein produced the typical ophthalmia by a sterilised infusion, devoid of the jequirity bacillus, and he com-

pletely deprived an infusion of its activity, though it was swarming with the microbe. The natives of India, to procure the hides of cattle, make a paste of the ground seeds, shape it into arrow points, and when dry insert them under the skin of the animals, and thus cause their death in a few hours. The activity of the abrus appears to depend upon a chemical substance or ferment. It contains no alkaloid. Martin and Wolfenden find the berries to contain a globulin and an albumose identical with those found in the carica papaya, the albumose of which is associated with the ferment—papain.

It is a remedy of value in the treatment of *granular lids*, and especially in those cases where the trachoma has disappeared, leaving a thick pannus. The corneal disasters at first reported are now known to have been produced by too repeated applications.

Much difference of opinion still exists, however, about the real value of jequirity in ophthalmic practice.

Shoemaker has used it in the form of paste, 1 to 4 of water to *lupus*, scrofulous, syphilitic, and indolent *ulcers*, chronic syphilitic sores, &c., and reports favourably of it.

Juglans Cinerea, or Butternut (U.S.P.)—The bark of the branches has been long used as a mild purgative, and in smaller doses as a laxative in *chronic constipation*. Combined with calomel it has been given in *intermittent fever* and in *dysentery*.

The nuts yield a bland, unirritating oil. The dose of the fluid extract is 1 to 2 drachms. The resinous extract (juglandin) may be given in doses of 5 to 10 grains as a purgative.

Kairine, or Hydrochlorate of Oxyethyl-Chinoline Hydride, is a powerful antipyretic, introduced by Filehene; it is a chinoline derivative. It is a white crystalline powder, with an unpleasant stinging and nauseous taste. 8 gr. doses every hour or half hour reduce the temperature. Its disagreeable taste and unpleasant after effects have told against it, and the drug is almost forgotten since the introduction of antipyrine and antifebrin.

It produces copious sweating and appears in the urine, which it stains a deep green colour. Morokhovez finds it makes the arterial blood a dark brown, and causes it to coagulate readily; the corpuscles are altered in shape, and the spectroscope reveals methæmoglobin; the heart becomes dilated through atony of the cardiac muscle. Collapse and death have followed its use. It has been given in nearly every disease where a high temperature has been recorded. The after-rise is generally ushered in by a rigor.

Kandol.—Synonym for Canadol (page 523).

Kaolin is native white silicate of alumina, the product of decomposition of felspar and quartz. It is a pearly white powder, and acts as a protective application when applied to *weeping eczema*, *intertrigo*, *prurigo*, *impetigo*, &c. It is chemically inert, and is unacted upon by the majority of reagents, and hence has been used as a pill excipient by Martindale for permanganate of potassium, nitrate of silver, &c.

Kava Kava—The root of *Piper Methisticum* has been attracting considerable attention. Kava was prepared from it by masticating the root for some time in the mouth, adding water to the fibrous pulp resulting from the chewing, and straining—(Yangona brewing). It is now generally prepared by simply pounding or grating the root. After a moderate dose the effect appears to be something like that produced by a large dose of caffeine—a sharpening of the mental faculties and a feeling of freedom from fatigue.

It acts upon the cord, and causes an ataxic gait, after being very freely partaken of, the intellect remaining bright. Kesteven finds that it acts as an alterative upon the genito-urinary organs, and he uses it with success in *chronic gleet* and *obstinate cystitis*. It is a stimulating diuretic, and has been found to reduce the acidity of the urine.

The *a*-resin obtained from it acts powerfully as a local anæsthetic like cocaine.

Cerna has recently investigated the action of this substance; he finds that the fluid extract, or the resin, produces anæsthesia of the mouth which lasts for hours. Internally it produces general anæsthesia by destroying the function of the peripheries of the sensory nerves; it diminishes reflex action and causes spinal paralysis.

Keratine is an albuminous substance obtained from horn, it is only used for coating pills in order that they may pass through the stomach without being acted upon by the gastric juice. (See page 50.)

Kola Nut (*Sterculia Acuminata*)—This nut has been used by the natives of Central Africa as a substitute for tea and coffee, and various marvellous virtues have been attributed to it. It contains large quantities of an alkaloid identical with caffeine. Hudson reports a case of cardiac weakness treated successfully by 150 grs. of Kola paste twice daily. Monnet found it produced insomnia, was an aphrodisiac, stimulant to the cerebrum, restrained tissue waste, was diuretic and had powerful cardiac tonic properties, and controlled diarrhœa and acted as a general tonic in doses of 1 dr. of the tincture (1 of the nut to 5) or 2 grs. of the alcoholic extract. In smaller doses it is a gastric tonic,

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useful in *dyspepsia*, and an *astringent* in *diarrhœa* on account of the tannin it contains.

Koumiss is a palatable effervescing liquid, prepared by exciting fermentative changes in the milk of the cow, or mare. It was originally made in Tartary from the milk of the mare, but cow's milk is the basis of all the varieties at present used in this country.

Sakovich rubs up 1 pint of a mixture of the fresh, unskimmed morning milk from the cow, and cold water (equal parts) with 15 grs. of German yeast in a mortar. To this 1 oz. of finely powdered white sugar is added, and the mixture is poured into a champagne bottle and exposed for 24 hours in a warm place (a little over 60° F.) After this it is carefully corked and tied down, and placed in a cool cellar for five days, after which time it is ready for use. The casein is *partially* digested by the fermentation which causes the sugar to be changed into lactic acid, which acts in its turn upon the casein. This precipitation of the casein by the acid relieves the stomach of some of its work.

Ponomaroff has used the cow koumiss with infants successfully. He mixed 1 glassful of unskimmed milk with 2 of water, added 1 tea-spoonful of sugar of milk, and 2 of sugar, and one and a half of beer yeast, and corked all up in a champagne bottle, and shook it frequently. At the ordinary temperature of the room the koumiss was ready in forty-eight hours, and contained $\frac{1}{2}$ per cent. of alcohol. The writer has found that the following is the simplest and best of all plans for the production of artificial koumiss, as detailed in his Dictionary of Treatment, page 654 :—

In the absence of yeast, a palatable and highly nutritious beverage may be prepared by mixing one part of fresh rich buttermilk and one part of water with eight parts of cow's milk, adding a very little loaf sugar, putting the mixture into a loosely-corked gallon jar, leaving it in a *warm*, but not hot, place beside the fire, where it may be frequently and briskly shaken, and in 36 to 48 hours it is ready for use as a pleasant, sharp-tasted, thick liquid, which slightly effervesces. Some little skill and experience is required in producing a uniform result, and the patient should not give it up if the first and second results are unsatisfactory. After the first batch of this artificial koumiss has been successfully prepared the use of buttermilk may be entirely dispensed with, as an equal bulk of the koumiss liquid can be used instead, in the preparation of each subsequent quantity. Some patients succeed best by leaving out the sugar entirely, and by shaking the mixture very seldom during the first 24 hours. It may be taken *ad lib.* The buttermilk referred to above is that obtained

in the process where the cream and milk have been both churned together in the manufacture of butter.

Koumiss is undoubtedly one of the most easily assimilated and nutritious of foods and remedies. It is invaluable in the treatment of all *wasting lung diseases*, in which case it may be taken *ad libitum*. The weight of the body soon markedly increases under its use, and it will be appreciated when cod-liver oil cannot be tolerated. In various forms of *dyspepsia*, and especially in the *diarrhœa of children*, its use is attended with great benefit. In the protracted convalescence after *fever, kidney disease, &c.*, and in many forms of *chronic vomiting*, it may be tried with every prospect of success.

Kefir—Under this name has recently been introduced a new fermented milk, which has been used by the natives of the plains near the Caucasus as a remedy for *anæmia, struma, chest affections, and gastric troubles*. It is like koumiss, and is prepared from the milk of the cow or mare by adding a minute mushroom collected near the snow-line on the Northern Caucasus; this fungus can be used over again repeatedly, and is a remarkable and powerful ferment which produces a rich, sparkling beverage in 24 hours. In the vessel in which this kefir is made small hard granules are found of a brownish-yellow colour. These can now be obtained from chemists, and as they maintain their activity unimpaired for long periods, they are very convenient for the manufacture of this beverage, but, as a rule, the above formula answers all requirements. Dose—Same as koumiss.

Lachnanthes Tinctoria (Red Root, or Spirit Weed) is a plant which has been recently used in America as a remedy in pulmonary complaints. It is said to possess, in addition to its expectorant powers, some alterative action on the bronchial surface. Nankivell reports that he has seen most remarkable benefit from its use in pulmonary *phthisis*, even in the cavernous stage. Percy Wilde, in "New Remedies," states that he has used it frequently without any very decided results; though the drug has been praised as a remedy for pneumonia, typhus, laryngitis, cerebral affections, and hosts of other ailments. It is very doubtful if it possesses any marked therapeutic virtues.

Dose of the tincture, made with the entire plant (1 in 10), 30 to 60 minims.

Lamium Album is a labiate plant long used on the Continent by peasants as a popular expectorant. Florain has discovered that the flowers possess powerful hæmostatic properties, and can be used with advantage in hæmorrhages of all kinds, from the lungs, stomach, kidneys, and uterus. He gives a tincture of the

blossoms 2 parts, syrup 1 part, and water to 6 parts, in $\frac{1}{2}$ dr. doses every 30 minutes till the hæmorrhage stops. The strength of the tincture is 1 in 5.

Lantanine—Neyrete extracted an alkaloid from Yerba sagrada, which he called Lantanine, possessing properties closely resembling quinine, thus it is intensely bitter, a powerful antipyretic and antiperiodic, but it does not interfere with digestion or cause nausea. It may be given in *ague* in doses of 25 to 30 grs. in wafer paper, which prevents its intense bitterness being detected. In *neuralgia* it may be given in 5 gr. doses.

Lappa, or Burdock (U.S.P.)—The root of *Lappa Officinalis* has been used in America as an alterative; it possesses diuretic properties, and appears to have more deserving claims as a remedy in the class of diseases for which sarsaparilla is vaunted. It has certainly some power over *chronic scaly skin affections*. A tincture of the *fruit* (1 in 5) has been used with success in teaspoonful doses in *psoriasis inveterata*, where the palms and nails are badly affected.

Leptandra, or Culver's Root (U.S.P.)—The eclectic preparation from *Veronica*, or *L. virginica*, in the form of a brownish-green powder, resembling podophyllin, is the one generally used in medicine. It has been used in *liver diseases*, as a tonic, cholagogue, and purgative, according to the dose administered. It stimulates mildly the liver, and acts as an intestinal tonic and stimulant or irritant, and has been used in *diarrhœa* and *dysentery*, and as an adjuvant to podophyllin. Dose, in pill, 1—3 grs.

Licoperdon Giganteum, or Puff-ball — This common fungus, belonging to the natural order Trichogastres, is found near the fences on the margins of woods, and has been long known to possess hæmostatic properties. It has been re-introduced by Dr. E. Thompson, and will be found a most valuable addition to therapeutics. It forms a soft and comfortable *surgical dressing*, in addition to its hæmostatic properties. The mature plant, which is about the size of a foetal head, is employed. On breaking the outer skin, the dusty mass, consisting of the capillitium and spores is the portion used. The writer has seen it used in *formidable hæmorrhages*, dusted over the bleeding surface and plugged into deep and tortuous wounds where the open vessels could not be reached with a ligature, and the rapid and effective manner in which it arrested bleeding was most surprising. He has seen it immediately arrest copious hæmorrhages, which he believes could not have been controlled by any other hæmostatic. How it acts is unknown.

Hagen's experiments upon the coagulation of blood have led some to suppose that the puff-ball acts by permitting the blood

to deposit hæmato-blasts within its meshes, which thus become adhesive points for the subsequent attachments of particles of fibrin. The almost magical rapidity of the action of this blood-stauncher seems hardly explicable to the writer on this hypothesis. The objectionable fetor that results after the application of puff-ball to wounds may be a serious barrier to its usefulness.

This fungus has been known to produce poisonous symptoms when eaten raw, but it is harmless and agreeable to eat when cooked.

The writer, in bleeding *hæmorrhoids* or *fissures*, has had great satisfaction with this remedy, which he uses plugged into large hollow suppositories and inserted into the rectum. He has been able to satisfy himself that he has saved life in this way, in a case in which the shock of an operation would have been fatal. He finds it to be an excellent remedy for *epistaxis*, and he plugs the nostrils with the fungus, leaving it *in situ* for several days, and always finds it to act most satisfactorily in stopping the bleeding.

Liparin is an oily liquid consisting of 6 parts of oleic acid and 94 parts of the finest olive oil. It is introduced as a substitute for cod liver oil, and it may be administered in the same manner and in similar doses. There is no evidence that it possesses anything like the nutritive value of the fish oil.

Lippia Mexicana is an evergreen, creeping, verbenaceous shrub, containing a camphor called Lippiol, which is its active principle. Lippia is a valuable expectorant, and has been given with good results in every form of *bronchitis*, in *asthma* and *phthisis*. A tincture (1 in 10) made with rectified spirit from the fresh plant (leaves and flowers) may be given in doses of 10 to 40 minims.

Lycopodium Clavatum — Fenwick, in a *resumé* of the drugs recently used in *genito-urinary* affections, speaks of the great value of a tincture made from white club moss, in frequent micturition, and irritable bladder. He gives 15 to 60 minims of an ethereal tincture (1 in 5). The drug is used also in the *spasmodic retention of urine* in children, it is also a carminative and laxative and has been given in *enteritis* and *rheumatism*. Externally, it may be dusted over *eczema* and *intertrigo* in children and fat subjects.

Lycopus Virginicus, bugle or charm weed, is a plant of the Labiate order much prized by the American Indians as an expectorant internally, and as an external remedy for snake bites. It has marked astringent properties and has been used as a hæmostatic in *hæmoptysis*. In large doses it has sedative properties; it may be given in doses of $\frac{1}{2}$ to 1 oz. daily of the entire herb made into a decoction or infusion.

Lysol is a thick oily liquid with a tarry odour, obtained by saponification of oil of tar and fat by alkalis; it is soluble in water, powerfully antiseptic, and it is claimed for it that it is superior to carbolic acid and creolin. It is more uniform in its composition and effects than the latter drug, and, in addition to its antiseptic and disinfectant properties, it is a soap. It is only faintly toxic and has been much used in Germany as a disinfectant for the hands, skin, and instruments, for wounds, and for uterine and vaginal injections in solutions, varying from $\frac{1}{2}$ to 3 or even 5 per cent. It has been recommended as an application to *lupus*.

Maize, or Mays.—See Zea Mays.

Malti Extractum, or Extract of Malt or Byne (U.S.P.), contains the active principle—diastase—a digestive ferment possessing the property, even when exceedingly diluted, of changing starch into sugar, like the ptyalin of the saliva. Its efficacy depends entirely upon the amount of diastase present, which, in many of the syrupy extracts to be met with, is very trifling. It is useful in cases where the digestive process is weak, and the assimilation of starchy foods is imperfect. It is a restorative, and is regarded as of more value than cod-liver oil by some. It may be given in doses ranging from a tea-spoonful to a table-spoonful in milk, wine, beer, porridge, tea, or cod-liver oil after meals. Its high nutritive value renders it an agent of great utility in *phthisis*, *scrofula*, *rickets*, and many *wasting diseases*. It is a good plan to mix it with the food before being swallowed in *dyspepsia*, and wherever the digestive functions seem to be seriously impaired. The experiments of Chittenden show that it should be given at the *beginning* of a meal when we wish to produce a decided effect upon digestion. It will not act in acid fluids, and consequently is of most value when given at a time when the acidity of the stomach is least. Combined with cod-liver oil, malt extract is of great value, and the writer has obtained most gratifying results with Burroughs, Welcome & Co.'s preparation, in wasting pulmonary disease.

The consistency of most of the Malt Extracts in the market is a great disadvantage. Allen & Hanbury's Liquid Bynin is a great improvement.

Manaca, or Vegetable Mercury—The root, with portions of the attached stem covered with bark, of the scrophulariaceous plant (*Franciscea Uniflora*), has been long used by the Indians as a remedy for *rheumatism* and *syphilis*. In America it has been used in *subacute* and *chronic rheumatism*. Its virtues have been vaunted in *scrofula* and a host of ailments, in which it will probably be found to possess little or no power. It appears to be a diuretic and emmenagogue, and in large doses a purgative.

Dose—20 to 60 minims, or even 2 drs., of the fluid extract (1 to 1) or 10 grs. of the powdered bark.

Mandrake (*Atropa Mandragora*)—W. B. Richardson advises the introduction of this plant, whose study he was induced to take up after reading of its wonderful properties in the works of ancient writers. He found that a weak tincture, or a wine of the plant, was a powerful narcotic and anæsthetic, a few drops applied to the tongue causing numbness of long duration, and when given internally producing sleep after fulness in the head, disturbed vision, and cerebral excitement. Rabbits were poisoned by large doses, and it was found that the heart was unaffected. He believes that the plant contains an alkaloid like atropine, which, if isolated, would be a great acquisition to therapeutics. Mandragorine has since been used as a mydriatic.

Mango (*Magnifera Indica*)—Used by the Indians as a masticatory, is an astringent with special tonic action upon the mucous membranes, and has been highly recommended in *hæmorrhages* and *mucopurulent discharges* from the uterus, intestines, and bronchi. A liquid extract (1 in 1) made from the leaves and stems may be taken in doses of 5 to 10 minims every two or three hours in water. It does not disarrange the digestive organs, and is pleasant to the taste. The rind of the fruit of *Garcinia mangostana* has similar properties, and is used in the same way.

Maté, or *Ilex paraguayensis*, is the Brazilian holly which contains a considerable amount of caffeine, and is used in Brazil made into an infusion like tea. Its therapeutic properties depend upon the caffeine and tannin contained in its leaves. It has been given with benefit in *failing compensation* and in *migrainous headaches*. According to the researches of Charles it contains only about $\frac{1}{4}$ the quantity of caffeine contained in tea. It has been given in daily doses of 1 oz.

Menispermin (Yellow Parilla)—The eclectic extract, in the form of a brownish powder, containing the active principle of *Menispermum canadense* (Canadian Moonseed), U.S.P., and *M. fenestratum*. It is a weak intestinal stimulant, and possesses no power over the liver. It is, however, a valuable tonic, and has been given in *dyspepsia* and as an alterative remedy in *constipation*, 2-5 grs.

Metachloral, or Insoluble Chloral, is a volatile powder, with an ethereal odour, prepared from liquid anhydrous chloral. It is recommended by Dujardin-Beaumetz for external application on account of its insolubility and stability in the presence of warmth and moisture. He uses it as a substitute for iodoform; it acts in the same way, and is free from the intolerable odour of that drug. It can be used alone or mixed with lycopodium, talc, or zinc powder. Limousin used it mixed with gum arabic, and made

into suppositories or rods for introduction into the rectum or into wounds.

Methacetin, or Para-acetanisidin, is an odourless, crystalline powder, white or pinkish white, bitter, and sparingly soluble in water. It is prepared by a tedious process, starting with nitrophenol, which is changed into nitranisol, and afterwards into anisidin. It is a powerful antipyretic in doses about one half that of antifebrin and one quarter that of antipyrine. It is a potent antiseptic in 1 per cent. solution. In *fevers* of all kinds, *acute rheumatism*, *pneumonia*, and every condition in which antipyrine has been given it has been administered, acting with promptness and certainty. It is considered especially suitable for children. 5 or 6 grs. may be given as a full dose for an adult.

Methyl Chloride, or Chlormethyl—This gas is condensed in metal cylinders, and used as a local anæsthetic. Upon permitting it to escape it is mixed with air and obliquely thrown as a jet upon the pained part, which it freezes rapidly and deprives of sensibility. It has been extensively used in *sciatica* in the Paris Hospitals, and with much success. *Lumbago* readily yields to it. *Pains* and *neuralgia* of all kinds have been treated in this way recently by a plan called "Stypage." Pledgets of lint are steeped in methyl chloride, and when laid upon the pained part cause it to freeze. *Tetanus* has been treated in this way by stypage over the maxillæ and spine. Smet maintains that stypage is much better than Debove's plan of spraying.

Others use it by permitting a stream of the liquid to play upon a tampon of wool and silk laid upon the part, as the gas rapidly evaporates from the wool it freezes the part beneath (Helbing).

By saturating chloroform with the gas Richardson's Compound Liquid for general anæsthesia is produced.

Methylal is a limpid liquid, prepared by distilling methylic alcohol with H_2SO_4 in the presence of manganese peroxide. It was introduced by W. B. Richardson, and has been reported upon by many observers recently. Richardson states that it is an hypnotic and antispasmodic, lying between ethylic alcohol and ethylic ether; it reduces arterial tension, produces sleep, and, though it kills by paralysing the heart, it promises to become a safe and effective anæsthetic when mixed with ether. It may be given by mouth in aqueous solution (1 dr.), or by hypodermic injection, or by inhalation. Personali states that it is antagonistic to strychnine. It has been used as an hypnotic in *insomnia*, and mixed with glycerine and oil as a local application to relieve pain.

Methylic Alcohol, or Pyroxylic Spirit or Wood Naphtha, is a limpid, colourless liquid, a product of the destructive distillation of wood. It has been used as a remedy for *phthisis*, and Neligan

and others found great benefit from it in this disease. It has a powerful influence over the hacking cough, and relieves the distressing vomiting of the latter stages of tuberculosis. It appears to act as a sedative to the respiratory centre. Its unpleasant odour is a great barrier to its use. It may be given in doses of 10 minims in peppermint water and syrup. Spirit of wine mixed with 10 per cent. of this substance formerly constituted methylated spirit.

Methyl-Violet, or Pyoktanin, is one of the aniline dyes of very complex and possibly varying chemical composition. It is a weak antiseptic, and has been found to be free from toxic properties, as ordinarily employed, and has been extensively tried as a surgical dressing, and as an injection (1 per cent.) in *gonorrhœa*, *ozæna*, and *ophthalmia*. It is doubtful if the drug will ever come into general use owing to its power of staining the tissues, and recent reports are most unfavourable and disappointing. It was supposed by Moëtig to be capable of curing malignant tumours if injected into their substance, but Quenn proved that it was not diffusible. Ehrlich injected it in *sciatica* and *neuralgia*.

Methylene Blue is another of the aniline dyes. It exists in small greenish crystalline scales which impart a blue colour to the urine after being swallowed. This drug has been tried successfully, it is reported, in articular and muscular *rheumatism*, *sciatica*, and *lumbago* in doses of 2 to 3 grains in pill. Ehrlich found that the pure salt is a valuable means of relieving all forms of pain, appearing to act like antipyrine, over which it possesses the advantage of giving no pain when used subcutaneously.

Methylene, or Methylene Bichloride—Richardson introduced this colourless liquid for producing general anæsthesia. Morgan claims for it to be (1) *safer*, (2) *more rapid*, (3) *more manageable*, (4) *more easily recovered from* than chloroform. Two minutes suffice to establish anæsthesia, and about two drachms are enough, inhaled like chloroform. It has been given 1,800 times by him without a death, but many fatal cases have been reported in other hands, notwithstanding that the drug has been little used compared with ether and chloroform. It destroys life by paralysing the heart. It is found by ovariectomists to be more manageable than either chloroform or ether, and consequently it is much used in the operation of removing the ovaries. The claims of this anæsthetic have been prominently brought before the profession by Professors Genther and Eichholz. They have, as the result of considerable labour, discovered the rather startling fact that, hitherto, the bichloride of

methylenes obtainable was nothing but a mixture of 1 part of this drug with 4 of chloroform, and Gutzart maintains that, prepared by the old process, nothing else was possible. Genther acknowledges that this mixture is better than chloroform. He contrasts the action of the pure bichloride, as now produced, with chloroform, and strongly urges its advantages. He affirms that the pulse does not rise in the exciting stage as in chloroform narcosis, and that the pure drug is *safer*, having only slight depressing effect on the heart. He noticed that the rigidity of the neck was more marked than with chloroform, and that there was often salivation.

Mistletoe, or *Viscum Album*, has been used in America and in this country as a remedy possessing qualities similar to *digitalis*, and beneficial results have followed its use in *heart affections* and *dropsies*. It has been found that this drug possesses also strong ecboic action, which promises to give it a place amongst our emmenagogue remedies.

Dose—5 to 30 minims of a tincture (1 to 8 of spirit).

Mollin—This new basis for ointments is introduced by Kirsten. It is a potassium soap containing 17 per cent. of excess of fats, prepared by treating a mixture of equal weights of *cocoa-nut* oil and lard with 20 per cent. caustic potash, and 4 parts water. After saponification takes place, 17 per cent. fat is added, and 30 per cent. glycerine may be also added. Liebreich advises 100 of *sapo kalinus* (P.Pr.), 50 to 80 lard, and 10 glycerine; or equal parts of lanoline and *sapo kalinus*. The resulting ointment easily washes off the skin and clothes. It forms an elegant base for mercury, salicylic acid, and tincture of iodine. This latter, iodine mollin, is a valuable application to *scrofulous glands* and *diseased joints*.

Monesia, or *Chrysophyllum glycyphloeum*, is a Brazilian tree whose bark contains saponin and tannin in large amounts. Rosanoff has proved it to be an expectorant of great value, and an astringent especially indicated in *bronchitis* and *intestinal catarrhs*, and other observers place it first on the list of expectorants. It has been given in *hæmoptysis*, *epistaxis*, *menorrhagia*, *gonorrhœa*, *chronic diarrhœa*, and many other affections with marked success. It may be given for long periods. It has been locally applied to *ulcers*, *fissures* of mucous membranes, and to the urethra in *gleet*. Any preparation may be given in doses equivalent to 15 grains of the bark three times a day.

Moringa Pterygosperma root has been recently tried with benefit as a diuretic, acting somewhat like *digitalis*, only it is claimed for it that in renal, hepatic, or cardiac dropsy its action

is more rapid and reliable, the effects of the drug, according to Sachan, showing themselves within 24 hours after the administration of 10 to 50 minim doses of an alcoholic tincture of the dry root.

Morrhuel is an acid, bitter, aromatic, yellow liquid, containing the active principles of cod-liver oil, *i.e.*, the phosphorus, iodine, and bromine combined, with organic fatty matters. It is prepared by treating the oil with hot alcohol and distilling off the spirit. The morrhuel is very much smaller in bulk, and can be easily administered in capsules containing 3 to 5 minims each. It is not at all probable that the virtues of cod-liver oil are concentrated in this substance, but it can be used to great advantage in cases where the oil cannot be swallowed. Each capsule of 3 minims represents 80 minims of cod-liver oil.

Mullein.—See *Verbascum Thapsus*.

Muscarin—The active principle of poisonous fungi; is obtained from *Amanita* or *Agaricus muscaria*—Fly agaric—and can be prepared synthetically. It resembles pilocarpine closely in its action, thus it causes profuse salivation, perspiration, lachrymation, and gives rise to rather forcible and painful micturition; sometimes to nausea and diarrhœa.

When applied in solution (10 per cent.) to the eye, it dilates, and when swallowed it contracts the pupil.

It is administered in the form of a hypodermic injection of $\frac{1}{4}$ to $\frac{3}{4}$ gr. of the nitrate in 5 minims of water; it has been given in smaller doses by the mouth with success for the *night sweats* of phthisis. Murrell gives 5 minims hypodermically of a 1 per cent. solution for this purpose.

Muscarin is, with the exception of the local mydriatic and anhidrotic effects, a decided antagonist to every action of atropine. Atropine, thus, is the antidote in cases of poisoning with fungi, and the writer has been able to satisfy himself that he has saved several lives by the hypodermic injection of atropine upon an occasion when a large number of school children were poisoned by eating fungi.

Myrtol exists in the oil distilled from the leaves of *Myrtus communis*—the myrtle. It has been employed, as an expectorant, in capsules containing 5 minims. This remedy is indicated in chronic or sub-acute *bronchitis*, or at the end of acute attacks just as the fever disappears. It causes a diminution in the secretion. Two capsules may be given every 6 or 8 hours. 15 minims have been given with marked benefit in *gonorrhœa*, *leucorrhœa*, and various forms of *bronchial catarrh*, *cystitis*, &c. Recently its power as a disinfectant of the air passages has been demonstrated by Eichhorst, who found the sputum to be dis-

infected in a few hours in *gangrene of the lung* after the internal use of myrtol.

Naphthaline ($C_{10}H_8$)—This new antiseptic has lost ground since introduced by Lüke. It is obtained in gas making, and exists in the form of a white crystalline powder, which is insoluble in water. It is practically innocuous to man in doses far above those required in medicine, though powerfully destructive to all forms of minute life. It is dusted as a powder over *ulcers, sloughing wounds, open cancers, and chancres*, as well as to *fresh wounds and stumps*, and may be used for disinfecting cavities. After application the part should be covered with oiled silk and bandaged; a 10 per cent. ointment should be used. It is cheap, clean, disinfecting, produces rapid growth of granulations and cicatrices, diminishes irritability and pain, and its application is very simple and easy.

Rosbach has expressed himself in the highest terms of naphthaline as an intestinal disinfectant. He finds that it is so difficult of solution that it can be administered in doses fatal to all minute organisms in the intestinal tube from mouth to anus without doing the patient any harm, as it is not absorbed. He recommends it in *typhoid fever, diarrhæa, and dysentery*, and it has been loudly praised as a remedy of great promise in *cholera*, though it must be said that most recent observers deny its value as an intestinal disinfectant. Excellent results have been obtained by Rodinoff with injections of the drug in *dysentery*. It has been found to possess expectorant properties, and has been urged as a specific for *phthisis*. Fenwick speaks highly of it when given in *cystitis* with fetid urine; it is eliminated by the urine, which it colours brown, but boracic acid fills every requirement that can be wished for in this condition. Recently it has been praised as a remedy for *round-worm* and *tape-worm*. There is evidence produced by Charren to show that the administration of naphthaline may be followed by cataract and amaurosis, whilst many others have proved that it may cause renal disease, and the internal use of the drug requires caution. It has no action upon the heart or circulation.

Great confusion exists in the nomenclature of the naphthol compounds; thus this substance is described under the names Naphthalene, Naphthalin, Naphtalene, Naphtalin, &c. It is the substance known as Albo-carbon, Camphylene, and Alabastrine.

Dose for adults—2 to 8 grs. every 3 or 4 hours; for children— $\frac{1}{2}$ to 2 grs. in wafer paper. It may be given in pills coated with keratine.

Naphthaline Dioxide ($C_{10}H_8O_2$) is a white, glistening powder introduced by Lepine under the name of Dioxynaphthaline. Its formula will be seen to differ from that of naphthaline

by containing O_2 . It is poisonous in large doses, and cannot safely be used as a substitute for naphthaline since 15 grs. have produced cyanosis in a patient. It is said to act as a powerful muscular excitant.

Naphthalol.—See Betol, page 519.

Naphthol ($C_{10}H_7OH$) or Beta- or Iso-Naphthol—It is in minute, shining, white crystals, with an agreeable balsamic odour and burning taste, prepared from naphthaline by the action of fuming sulphuric acid at a high temperature. When absorbed, according to Brunton, it causes vomiting, loss of consciousness, and hæmaturia. Bouchard affirms that this substance is the best known intestinal disinfectant, and that it would require $\frac{1}{2}$ lb. to kill an adult weighing 130 lbs., whilst 40 grs. will produce intestinal disinfection. It has been used with success as a gastric disinfectant in cases of *pyloric obstruction*; it may be combined with salicylate or other salt of bismuth. Those who have employed it as an intestinal disinfectant in *typhoid* fever speak very highly of it, and M. Bruce believes that it shortens the duration of the attack and lessens the risk of complications; and many other authorities corroborate his conclusions.

Its action upon the skin resembles that of tar, and it is for this that it has been introduced into medicine. Kaposi uses it with great benefit in *eczema*, *psoriasis*, *scabies*, *chronic ulcers*, &c. It has been likewise used as a gargle in *diphtheria*, an injection in *leucorrhœa*, *gonorrhœa*, &c., in the strength of 2 to 5 per cent. Ointments for scabies and psoriasis should contain 15 per cent., and for *tinea* 20 to 30 per cent.

Microcidine is a new antiseptic and disinfectant, existing as a white powder, prepared by fusing together beta-naphthol and caustic soda. It is soluble in three times its weight of water, and has been used as a lotion to wounds and sores (2 grs. to 1 oz.). It is said to be free from toxic properties.

Naphthol ($C_{10}H_8O$), or Alpha- or Ortho-Naphthol—M. Maximowitch introduced this substance which had hitherto not been used in medicine. Chemically it differs from the preceding only in the position of the hydroxyl group. It closely resembles beta-naphthol, and is almost insoluble in water (1 in 2,500), but soluble in alcohol and ether. The above observer found that 1 in 10,000 made a solution which completely arrested the growth of various microbes. It may be used in every case where the beta-naphthol is employed, and Maximowitch calculates that the lethal dose for a man would be about 20 oz. Shoemaker, who has extensively employed this drug in many varieties of skin diseases, speaks highly of it as a disinfectant and antiseptic, and he obtained good results in *gonorrhœa* and *gleet*, but he states that

it lacks to a great extent the anæsthetic or sedative effects of beta-naphthol in skin affections, and that its internal action is less decided.

Ellenberger and Hofmeister have introduced acids derived from both alpha- and beta-naphthols as powerful antiseptics. One of these is Alpha-oxynaphthoic Acid, which forms soda and potash salts. Schückling strongly recommends the acid as an odourless and cheap substitute for iodoform. He also used a solution ($\frac{1}{2}$ to 1 per cent.) in combination with phosphate of soda in *leucorrhœa*. (See page 504.) Thus, of the new Naphthol disinfectants there appears to be no end.

HYDRONAPHTHOL is described upon page 556.

BENZOYL-NAPHTHOL is mentioned upon page 519.

Narcine is an alkaloid obtained from opium, in white, silky crystals about whose value as an hypnotic there has been much difference of opinion. It produces sleep, but some affirm it has very feeble powers, whilst others assert that it is a powerful soporific. It has been used to soothe the cough of *phthisis*. Laborde has had considerable success with it in *whooping-cough*; he finds that it produces sleep, and checks considerably the night attacks of coughing. He gives $\frac{1}{5}$ gr. to children 3 to 4 years old. It produces no headache or constipation, and is soluble 1 gr. in 1 oz. water.

The Meconates of Narceine (*mono*-, and *bi*-) are chiefly employed and have been given hypodermically.

Naregamia Alata, or Goa Ipecacuanha, is a small Indian shrub, the juice of which has recently been extolled as a remedy for *psoriasis*. The root is emetic and cholagogue, and in small doses possesses marked expectorant properties. It has been used in *bronchial* affections, *indigestion* and *rheumatism*. The best results appear to be obtainable in *emphysema* and *dry catarrhs*. The dose of the powdered root is 20 grs.

Nerium Oleander, or Laurier-rose, is a plant of the same order as *Strophanthus*, and is introduced as a new cardiac tonic in failing compensation. It has been investigated by D-Beaumetz, who found it to be a very active poison. Its active principle, oleandrine, has been isolated, but there are as yet no definite data or clearly recognised indications for its administration. The dose of the tincture made from the leaves and bark of the plant (1 in 5) is 5 minims.

Nickel Salts, especially the bromide, have been investigated by Da Costa, who has given it in *epilepsy* with advantage and in congestive headaches with decided benefit. He finds that much smaller doses are necessary than of other bromides; thus 5 grs.

is a fair dose and 10 grs. a very full dose. It is a green soluble substance. Shoemaker states that if given for a long period this salt possesses the disadvantage of causing metallic poisoning, and he states it is best given in effervescence. The sulphate (3 to 5 grs. in solution) has been administered as a nervine tonic in *locomotor ataxy*.

He gives the bromide either in a pill or as a syrup, thus—Bromide of nickel $2\frac{1}{2}$ drs., glycerine $\frac{1}{2}$ oz., water 4 oz., sugar 8 oz. The oleate of nickel is used as an ointment in *chronic eczema*, 10 grs. to 1 oz. Nickel-Carbonyl has been recently investigated, it is found to displace oxygen from hæmoglobin, but as yet there are no clear indications for its therapeutic use.

Nitrogen—Valenzuela found that inhalations of air, with the addition of half its volume of nitrogen, produced quickening of pulse and respiration and increase of body heat, soon, however (in 5 minutes), followed by slowing of the heart and breathing, and a marked fall in temperature, and elimination of urea, the effects being much the same as when rarefied air is breathed, the combustion being checked by the absence of the usual amount of oxygen. He used the inhalations in cases of phthisis, and reports, "always with the suspension of the progress of the disease." Sweating, fever, cough, pain, expectoration, dyspnœa, and wasting become much less. The patient eats, sleeps, and digests better, and soon begins to gain in weight. Good results were also found in *asthma* and many other irritable conditions of the pulmonary apparatus. The usual rule was—two inhalations in the day for $\frac{1}{2}$ to 1 hour each. It would appear that Nitrogen when thus used to dilute atmospheric air may, when judiciously administered, be a valuable antipyretic.

Nitrous Oxide—This colourless, inodorous gas is used as an inhalation to produce general anæsthesia like ether and chloroform. The method by which it produces its effects is still doubtful. It is, however, certain that it affects the cerebral centres, not the peripheries, and it is not decomposed in the system, as some supposed. Joylet and Blanche affirm that the oxide has no effect whatever upon the system, save that of deprivation of oxygen, and it is stated that, save exhilaration, the same result is obtainable with pure nitrogen or by asphyxia. A few deaths have been reported from its use. It differs from chloroform and ether in the rapidity of its action and the quickness with which its effects pass off, so that it is only available for very short operations like teeth extraction. Glycosuria has been several times known to follow its administration.

Oils—The hypodermic injection of various oils has been extensively tried of late in France and Germany, and excellent

results have been obtained. Pure sterilised olive, almond, cod-liver, or other oil, may be injected several times daily, and there is abundance of evidence of their being absorbed and adding to the general body-weight. It is, however, as a means of introducing active substances that this new method of medication has attracted such interest.

Creasote is the drug which has been tried most extensively. Gimbert and Burlureaux have reported success from the injection of olive oil, containing 10 per cent. of the purest beech-wood creasote, in *phthisis*, *lupus*, and *scrofula*.

Picot, of Bordeaux, reports excellent results in *phthisis* and *tubercular pleurisy* from injections of a solution of guaiacol and iodoform in sterilised olive oil or liquid vaseline. He claims for this plan that after 12 injections the cough diminishes, the appetite improves, and the signs of the disease disappear; and he even states that cavities dry up, the injections are not painful or irritating, do not cause fever or indigestion, and are harmless. He selects the supraspinous fossæ and injects one cubic centimetre (15 minims) of a solution containing '154 grs. iodoform and '77 grs. guaiacol. This is gradually increased till $\frac{1}{2}$ gr. iodoform and $2\frac{1}{2}$ grs. guaiacol are injected each time. The solution can be made by dissolving 15 grs. iodoform and 75 grs. guaiacol in 14 drs. olive oil and 14 drs. liquid vaseline.

Pignol has obtained similar results by using a solution containing in each 15 minims 2 grs. eucalyptol, $\frac{3}{4}$ gr. guaiacol, and $\frac{1}{7}$ gr. iodoform. Morel-Lavallee uses a solution containing a little less eucalyptol, the same amount of guaiacol, and 4 times as much iodoform. The injections of 3 cubic centimetres (46 minims) may be given twice a day. Perron uses trotter oil for the solution of creasote, which he injects into the region of the buttock. Bourget gives guaiacol in almond oil by the rectum. Huchard injects hypodermically camphorated olive oil 4 per cent. in *phthisis*.

Opium Smoking—Thudichum has advocated this method of using opium as a remedy in various diseases, especially to calm cough, relieve *cephalalgia*, *migraine*, and *neuralgia*, in which latter affection it is claimed to be curative. The aqueous extract of opium is recommended in minute quantities (2–5 grs.), placed in the bowl of a diminutive pipe. It is claimed for the method that it produces no digestive troubles, and is not likely to be followed by the establishment of the opium habit. With the strong feeling in this country against the horrors of opium smoking, it is highly improbable that it will ever be even seriously tried.

Orexine is the Hydrochloride of Phenylidihydrochinazolin. It has been extolled by Penzoldt and others as a marvellous

gastric tonic and stimulant to the mucous membrane of the stomach. Little is known of its action, but it has been given with satisfactory results in cases of *phthisis* where the appetite had entirely failed. Dr. Gordon employed it in doses of $\frac{1}{8}$ grain in water; but owing to its biting taste it can be given to greater advantage in the form of capsule. Limousin gives the dose as 30 to 50 centigrammes—*i.e.*, 4·6 to 7·7 grs.—and recommends the pilular form; but Helbing reports that the pills have been found to remain in the stomach for hours without being digested. Excellent Continental reports are forthcoming showing the great power of the drug in increasing the appetite (5 grain doses) in *phthisis* and *after operations* and in *anæmia*.

Orthine, or Orthohydrazin-paraxy-benzoic Acid, is a new antipyretic, the hydrochlorate of which is a stable soluble salt.

It is introduced by Kobert, who obtained it by acting upon hydrazine with an acid isomeric with salicylic. Experiments with dogs seemed to show that it was free from danger, but when given to man it caused severe perspiration, followed by collapse and delirium.

Unvericht used it as an antipyretic in *typhoid fever*, *acute rheumatism*, and *pneumonia*. It must, however, be used with great caution, and it is not evident that it possesses any advantages over the tried antipyretics.

Orthosyphon Stamineus is strongly recommended by Frochard as a powerful diuretic. $1\frac{1}{2}$ drs. to 40 oz. water made into an infusion may be daily administered; it is in this form known as Java Tea, and is free from danger and objections. This dose may be doubled after a few days. He gives cases of vesical calculus where the urine became at once abundant and clear under its use, and he also reports a case of *ascites* which rapidly improved under its administration, the abdomen diminishing in size several centimetres weekly. Mr. Christy states that the plant belongs to the Labiatae, and is known in Java as Koumis Koutjing, or Cat's Moustachios, and the leaves when cured resemble Souchong tea.

Osmic Acid.—See Acid. Osmicum.

Ouabaine is the name of a crystalline glucoside extracted from an arrow poison from Eastern Africa. It has been investigated by Arnaud, Varigny, Langlois, and Gley, who find that it contains a glucoside obtained from the wood of a tree belonging to the Apocynæ family. This has been determined by Poisson to be the *Acocanthera Ouabaio*. The glucoside is believed by Arnaud to be identical with strophanthin, and acts powerfully upon the respiratory and cardiac centres. It is, however, stated to be twice as poisonous and twice as rapid as the glucoside from

strophanthus. It is expected that it may replace other members of the same order, especially as it exists in the chips and sawings of the timber, and can be produced cheaply and in great abundance. $\frac{1}{1200}$ grain kills a guinea-pig in less than half an hour. Like strophanthin, it acts more slowly when taken by the stomach.

Gemmell has obtained excellent results with this glucoside in whooping-cough, and he claims for it that it shortens the first and second stages of the disease, and diminishes the length of the convalescent stage. He gives it in doses of $\frac{1}{1000}$ grain to children 5 years old, though in some cases he increases the dose to $\frac{1}{250}$ grain.

Oxalic Acid is a powerful poison acting upon the nerve centres, and upon the heart, and often exerting corrosive action upon the coating of the stomach. Recently Poulet has discovered that it is a valuable emmenagogue. He gives in *amenorrhœa* dr. doses of an 8 oz. mixture, containing 31 grs. (so that the dose is about $\frac{1}{2}$ gr.) every hour. He uses the acid also in cases of excitement of the respiratory centre, as in *dyspnœa* and *asthma*.

Oxygen—Lashkevitch has shown that oxygen has the power of markedly lowering excited reflex action, and he suggested that a trial of its use in *puerperal eclampsia* might lead to good results. Dr. Favr has tried inhalations in two cases of *eclampsia* with, what must be pronounced to be a very decided success, and he is sanguine that its use in every lying-in hospital will be soon a matter of routine when symptoms of convulsions appear.

Kirnberger has been trying the value of oxygen in *leukæmia* with the view of obviating the retarded tissue metamorphosis which is characteristic of the disease. He details a case where, after the daily inhalation of 30 litres of the gas for 10 days, the patient—a boy—showed marked signs of improvement, and at the end of 6 or 8 weeks appeared to be well. He was submitted to a renewal of the treatment a few times during the six months following, and finally was completely restored to health.

Dr. Galan has recorded the successful use of oxygen inhalation in cases of severe and very extensive burns interfering with the cutaneous respiration; 70 litres per day were used, and good results have followed the use of oxygenated baths in similar cases.

Dujardin-Beaumetz has introduced syphons of water and lemonade charged with oxygen gas (instead of carbonic acid), which he has found beneficial in *dyspepsia* and *diabetes*. The writer in 1874 tried ozone for the relief of acute suffocative *bronchitis*, but found that the relief afforded by the first few moments of inhalation was more than counterbalanced by the increased embarrassment of the breathing which supervened.

Sinainski has (Sept., '88) reported a case in which he is satisfied that oxygen inhalation had saved the life of a child 18 months old who was dying from *acute bronchitis*. Good reports are forthcoming of its use in *cardiac diseases*, *phthisis*, *pleurisy*, *morphine poisoning*, and *anæmia*.

Recently, Kellogg has urged the use of enemata of oxygen 2 litres daily in *lithiasis*, and states that much more of the gas is absorbed from the rectum than by inhalation.

Ozoneine is the name of a new liquid prepared by Beck, and which has been tested by Long and Brand, of Toulon, in *cholera* and *smallpox* with encouraging results. Onimus, of Paris, has found it to be little inferior in its disinfecting properties to pure gaseous ozone, to which it owes its valuable germ-destroying qualities. Further experience will probably assign to it a place amongst antiseptic remedies. It may be practically regarded as a saturated solution of ozone.

Ozonic Ether is a colourless liquid consisting of ether and strong peroxide of hydrogen solution and a variable quantity of alcohol. It is chiefly used as a blood test along with guaiacum tincture. It is a powerful diffusible stimulant and has been strongly recommended, in 30 minim doses, as a remedy for *diabetes*, upon the theory that it causes the oxidation of the sugar in the blood. Under the name of Ethereal Oxygen it has been inhaled by means of a Wolff's bottle, after passing through a solution of Permanganate of potassium (2 per cent.), the ether and oxygen which are given off having been found beneficial in *asthma*, *pertussis*, and *phthisis*.

Pambotano, or Calycandra Houstoni, is a Mexican leguminous shrub, from which Bocquillon has isolated a glucoside. It has been employed as a substitute for quinine in fevers of malarial or other nature. It has been vaunted in *tubercular fever*, *typhoid*, and *influenza*. Valude administers a dose of the decoction containing about 2 oz. of the bark at one time.

Pancreatine—The various pancreatic ferments present great difficulty to the pharmacists who have attempted to present them in a palatable form. Their proneness to change and their odour prevented them receiving that trial which their importance justified. There are at least four digestive ferments produced in the pancreas, the most important being Trypsin, which changes proteids into peptones. Of the other ferments one emulsifies fats, one changes starch into sugar, and one coagulates the casein of milk. Under the name of Pancreatine is prepared from the pancreas of the pig a dried powder, which is mixed with pulverised malt. It may be given in doses of 3 to 5 grs. in *dyspepsia*. Benger's Liquor Pancreaticus is a tincture of the pig's pancreas

made with weak spirit, and contains at least three of the ferments. It may be mixed with food in tea-spoonful doses or added to nutritient enemata. It requires an alkaline medium for the ferments, and soda may be added with advantage. Milk as warm as when coming from the cow may be readily peptonised in this way by a tea-spoonful of the liquor added to each tumblerful.

The preparation sold under the name of Pancreatic Emulsion, and supposed to contain an emulsified and pancreatised animal fat, is often a compound which phthisical patients cannot tolerate.

Fairchild's Extractum Pancreatis, in the form of an unobjectionable dry powder, is by far the best preparation introduced. It can be added to the milk of the cow, which can be thus predigested, and is of enormous benefit in the feeding of feeble infants deprived of their natural nourishment.

Trypsin has been lately used with good results as a digestive application to the false membrane in *diphtheria*. It has also been injected into the bladder with the view of breaking up and digesting clots of blood which are too large to pass out of the urethra. A solution of Fairchild's extract, as made by Burroughs, Welcome & Co., can be utilised for this purpose.

Pao Pareiro, or *Geissospermum læve*, is a stately Brazilian Apocynaceous forest tree. An alkaloid called Pareirine or Geissospermine has been obtained from it, which has been used as a substitute for quinine in fevers of various kinds. It reduces the temperature, acting at the same time as a tonic, and diminishing the frequency of the heart beats without weakening that organ. The hydrochlorate of the alkaloid, according to B-Limousin, may be given in doses of 30 grains in rebellious fevers. A decoction of 1 oz. of the bark in a quart of water may be given in wine-glassful doses. Tiberica affirms that it has twice the therapeutic value of quinine.

Papain and Papayotin—Papain is the soluble ferment prepared from the juice of *Carica papaya* by precipitation with alcohol; it is in the form of a white powder. It possesses the remarkable power of digesting animal substances. Papayotin is, strictly speaking, the milky juice obtained by incisions made into the unripe fruit, collected and dried. The words papain and papayotin are, however, often used synonymously. In the West Indies the papaw juice is used to render the toughest meat quite soft and digestible.

Finkler with properly prepared papain has recently produced far better results than with pepsin, especially in the case of concentrated foods, and markedly so when the reaction is alkaline or neutral, as it often is in diseased stomachs, in which cases pepsin would be worthless. Moreover, the action of papain continues all down the intestines, whilst that of pepsin ceases in contact

with the alkaline juices, and the drug has a certain amount of anodyne or pain-relieving power. It has also been used as a remedy against *round* and *tape worms*, which it sometimes has destroyed by its digestive action. It has been used with varying success as a local remedy in *diphtheria*, where its application as a powder causes the disintegration of the false membrane. It has also been employed to destroy *warts*, *epitheliomas*, &c. Schwimmer has successfully used a solution (1 in 10) to cure fissures of the *tongue*. Recently papain has been proved to be a powerful galactagogue when given internally, or even applied locally, and the writer has satisfied himself of the great value of Finkler's papain in *dyspepsia*, chronic *gastritis*, and *cancer* of the stomach in doses of 2 to 3 grains. He obtains such excellent results with the drug that he seldom now uses pepsin. He combines it with dried carbonate of soda, carbonate of bismuth, and a little morphia.

There is also contained in the leaves a poisonous alkaloid called Carpaine which is not yet used in medicine.

Papaverine is one of the colourless, crystalline alkaloids of opium. Owing to impurities and difficulties in isolating these alkaloids, the greatest diversity of opinion exists about their action. Thus the ordinary dose of this substance is given as $\frac{1}{8}$ gr. Hoffmann affirmed he took 50 times this quantity without experiencing any effects whatever. Fronmüller states that it is narcotic, and that it dilates the pupil, and does not affect pulse, temperature, or respiration. Other observers find it markedly diminishes these. In our present state of knowledge its administration to man is not to be advocated.

Paracresotate of Phenol, or Methylsalol, is isomeric with cresalol. It exists as fine crystalline needles, or as a colourless crystalline powder, sparingly soluble in cold water. The paracresotate of soda has been used as a new antipyretic by Demme in *acute rheumatism*, and various forms of fever, as a substitute for salicylate of soda. It has been given in doses as high as 60 grs. without producing any toxic action, and children have taken 15 grs. to 30 grs. It produces profuse perspiration. 1 oz. boiling water will dissolve 20 grs. of the salt.

Parrish's Syrup (Syr. Ferri Phos. Co.) is one of the best known and most extensively employed of non-official remedies. It is known as "Chemical food," and is a valuable and agreeable method whereby the virtues of iron are combined with the restorative action of calcium and other salts. Each fluid drachm contains :—

Phosphates of iron, 1 gr. ; of calcium, $2\frac{1}{2}$ grs. ; of sodium, $\frac{1}{12}$ gr., and potassium, $\frac{1}{3}$ gr. Dose—1 to 2 drs., diluted.

The B.P.C. formula is much weaker than this.

Parthenine is an alkaloid yielded by *Parthenium*. 5 grs. three or four times a day have been given successfully in *facial neuralgia*, and *ague*, and other conditions where quinine is indicated. It has been found to act as an antipyretic and analgesic by Ulrici, according to B-Limousin.

The flowering herb from which the alkaloid has been extracted has been used as a gastric tonic and emmenagogue in teaspoonful doses of the fluid extract.

Pelletierine is an alkaloid named after the great French chemist; it is obtained from the bark of pomegranate root. The bark contains four alkaloids or pelletierines, only two of which are possessed of any anthelmintic action, and it is chiefly "Pelletierine," or its tannate, which is used in medicine. Pelletierine may be given in doses of 2 grains. 5 grains have been known to produce muscular weakness. It should be given fasting, and 10 grs. tannin may be given immediately before it. This plan of treating tape-worm has given far better and more uniform results than any other. Von Schröder has demonstrated the action of this remedy outside the body upon living specimens of *tænia serrata*; he found the addition of $\frac{1}{10000}$ part of pelletierine to the fluid containing the parasites caused their death in a few minutes. Pelletierine causes an increase of blood pressure and disturbs co-ordination. It has been given hypodermically in some forms of *paralysis*, *tetanus*, and *hydrophobia*, but with doubtful benefit. D-Beaumetz has given it with success in *Ménière's* disease, and Galezowski in paralysis of the third and sixth nerves.

The sulphate, hydrobromate, and the tannate of pelletierine have been given in 5 to 8 grain doses.

Pengawar Djambi, or Paku-Kidang—This hæmostatic has been brought under prominent notice by a number of Continental and American therapeutists.

The remedy consists of the silky hairs from the stems of a large variety of ferns in Sumatra, Java, China, India, and other tropical regions. It comes chiefly from Java, and has been known and used there for centuries. A portion of the hairy mass laid upon a bleeding wound almost instantly causes coagulation of the blood, and after examining the numerous wonderful reports of the surprising hæmostatic powers of the drug, even to the extent of rapidly stopping bleeding from great venous trunks, one cannot but be struck with the close resemblance it bears to the Puff-ball. (See page 568.)

Pental is a colourless mobile, volatile and inflammable liquid. It is isomeric with Amylene (Tri-methyl-ethylene). It is introduced as a general anæsthetic, chiefly in dental practice, where

the rapidity of its action and the short duration of its anæsthesia are advantages ; it is used upon an open sponge like chloroform.

Petroleum, or Rock Oil, is chiefly of interest on account of the large number of bodies derived from it, and which have a place amongst remedial agents. Thus Naphtha is the liquid portion which distills over below 122° F. ; from this are obtained by fractional distillation still more volatile liquids known as Benzine and Rhigolene, &c. Vaseline, Petrolatum, or Soft Paraffin, is the semi-solid mixture of hydrocarbons, which is obtained by purifying the residue after distilling off the naphtha and benzine liquids.—(See page 279).

A fluid vaseline is obtained from it, which is used as a vehicle for hypodermic injections, and as a spray in laryngeal troubles.

Petroleum is a popular counter-irritant in *rheumatism*, and an antiparasitic remedy in various skin diseases. It is a valuable stimulant to the scalp in *baldness*, alone or diluted with 2 to 5 times its volume of any oil. The writer uses a mixture of 1 part of petroleum and 3 of olive oil, as a routine application to the hair of the head in Charity Schools to destroy pediculi, as well as to prevent their appearance in the heads of the children.

Petroselinum or Parsley.—See Apiol.

Phenocoll is a new antipyretic closely allied to phenacetin. The hydrochlorate is a white crystalline powder (1 dr. dissolving in 2 oz. water). Kobert, Mering, and others have carefully tested the action of this drug and find that it is a speedy, safe, and reliable antipyretic and analgesic, no unpleasant symptoms following very large doses. Its virtues have been demonstrated in *acute rheumatism*, *typhoid fever*, *phthisis*, *neuralgia*, in doses of 8 grs., which Mering states are equivalent in therapeutic value to almost double this amount of antipyrine. It has thus been proved that phenocoll is a valuable addition to therapeutics, but it has not yet been shown in what respects it is superior to the better known members of the same class. It is best given in the tabloid form or in wafers.

Phenylacetic Acid crystallises in iridescent scales, which are very soluble in boiling water, though only slightly soluble in cold water. According to B.-Limousin, Williams has employed this remedy internally with success in *phthisis*, reporting that after its administration the cough diminishes, the appetite improves, and there is a general amelioration of all the symptoms and physical signs.

Alivia has used it in *typhus* and *typhoid* fevers.

10 to 15 minims of an alcoholic solution (1 in 6) may be given in 2 oz. water daily.

Phenylmethane, or Diphenylmethane, is a new antipyretic and analgesic which has been used by Giacomini. It has double the activity of antipyrine, and has been administered in half the usual dose of that drug—*i.e.*, about 8 grains given in wine. It exists in crystals, which are very soluble in alcohol and chloroform. The above mentioned authority affirms that it has more reliable pain relieving properties and stronger anti-rheumatic action than antipyrine. Nothing is as yet known of its drawbacks.

Phenyl-Salicylate.—See Salol.

Phenyl-Urethane.—See Euphorin.

Phloridzin is a principle existing in silky crystals which are obtained from the bark of the apple, cherry, pear, and plum tree. It is of interest chiefly owing to its being employed in the physiological laboratory, as an agent, which readily produces glycosuria or diabetes of short duration. It is said to be antiperiodic, and has been used in ague, like quinine, in similar doses.

Photoxylin is a thick fluid used in photography and introduced by Wahl as a substitute for collodion in surgical practice. It may be prepared by nitrating wood-pulp in the same way as cotton-wool is treated in its manufacture into gun-cotton; the resulting nitro-cellulose (3 to 5 parts) is dissolved in ether (100 parts). The film left when the ether evaporates is tougher and stronger than that left by collodion. It is used as a dressing for wounds and cuts, and Guranowski has achieved much success with it in cases of perforated tympanum, by painting over the edges of the aperture till it is completely closed. It forms a film impervious to moisture.

Phytolacca Decandra, or Poke Plant (U.S.P.), is one of the innumerable indigenous American plants lately vaunted as a remedy for very many diseases. Thus it is affirmed to be a specific in chronic *rheumatism*, *scrofula*, and *syphilis*, many *skin* affections, *diphtheria*, and inflammations of the *mammary gland*. How it is supposed to act in these widely different affections no one has attempted to explain. It is in full doses narcotic and emetic, and produces purging, and has been given in bronchial troubles. It appears at the best a rather dangerous remedy, and should not be given in doses of more than 5 to 10 mins. liquid extract (1 in 1). The powdered root has been applied to *burns* and *eczema* (1 to 8 lard). The powdered extractive known as Phytolaccin has been used as a cholagogue in *liver diseases* in doses of 2 to 5 grs.

Pichi, or *Fabiana imbricata*, has been tried in a number of diseases since Rusby and Ramires have reported upon it. It

consists of the young branches, which they have found to be powerfully diuretic and tonic. Its use is contra-indicated in advanced renal diseases. In *chronic catarrh of the bladder* and in *cystitis*, accompanied by calculi and gravel, this drug has been much prized in Chili, and Fenwick found it to possess considerable power over the *hæmaturia* and pain in renal calculus. Shoemaker states that, given in combination with an alkali, it holds uric acid in solution, and it is thought that its resin dissolves the mucus which binds together the particles of a stone, leading to disintegration and facilitating expulsion. It has been given in nocturnal *enuresis*. Dose of fluid extract (1 in 1), $\frac{1}{2}$ to 1 dr. ; in infusion (1 in 20), 2 oz.

Picric Acid.—See page 505.

Picro-Adonidin.—See page 507.

Picrotoxin.—See page, 452.

Pinus Pumilio, or Mugho or Mountain Pine—Under the names of Pinol, Pumiline, Ol. Templinum, or Krummolzol, this remedy has been used as an inhalation in pulmonary complaints, and is the basis of the “pine-cure” practised at various health resorts. Inferior terebinthinate products from the same pine are used in baths for *rheumatism*, *sciatica*, and *gout*, at the same places.

The pure essential oil, distilled from the young branches, may be taken internally (5 minims) in *bronchitis* and all wasting lung diseases ; it is excreted by the bronchial surface and acts as an astringent and expectorant. The oil may be used as a spray, or inhalation, or the vapour may be inhaled from the handkerchief, or it may be put into any of the various respirators or inhalers. By careful management the phthisical patient may be enabled to live in an atmosphere saturated with the oil, as it possesses only very slight irritating qualities. In this way at home the benefits of a stay at Arcachon may be to some extent enjoyed. Dr. Davidson has obtained excellent results from this treatment at Bournemouth.

Piper Methysticum.—See Kava Kava.

Piperazine is a body occurring in colourless, acicular crystals which easily dissolve in water. It is prepared synthetically from ethylenediamine, and is known as Ethylenimine, Diethylenediamine or Dispermine. Its formula is $C_4H_{10}N_2$. It was at first introduced under the name Spermine, having been considered to be identical with the active principle of Brown-Séguard's testicular emulsion or extract, and also with the crystalline body which Schreiner obtained from semen, calf's heart and liver. It was, moreover, also supposed to be identical with the body

which Ladenburg and Abel produced synthetically by heating chloride of ethylenimin, and with the body prepared under the name of Spermine, by Poehl, from the testicles and prostatic glands of young bulls and stallions.

It has been demonstrated to possess totally different pharmacological action from the testicular extract or Schreiner's spermine, and Bock's researches in the Berlin Pharmacological Institute prove that it is devoid of all vital stimulating properties.

Piperazine would consequently have rapidly passed into obscurity were it not for the discovery that it behaves in a remarkable manner with uric acid. In cold aqueous solution it dissolves *twelve* times as much uric acid as carbonate of lithium does under identical conditions, and the piperazine-uric acid compound is seven times more soluble than the lithium-uric acid combination. It is claimed that 1 part of piperazine and 1 part of uric acid dissolve in less than 1 drachm of water, whilst it requires nearly 1 ounce of water to dissolve the same quantity of uric acid lithium (the exact proportions being 50 and 368 parts). Even when the uric acid is in great excess piperazine forms the very soluble neutral salt, and never an acid salt.

An injection into the bladder has been recommended as a solvent of uric acid calculi.

It is non-caustic and harmless, and may be given hypodermically in doses of 5 grains, or by the mouth 8 grains, three times a day. There is every reason to believe that it will prove a valuable solvent for uric acid calculi. Vogt found that 15 grs. three times a day markedly increased the amount of urea and diminished the amount of uric acid in the urine; it also increases the quantity of urine passed. In *gout* the value of the drug is not yet demonstrated, but it is very probable that it will be found to be valuable in this disease and in lead poisoning. There is no evidence of its value in the host of ailments said to be so much benefited by spermine, and some writers have confused the clinical reports of these different substances.

Piperine (U.S.P.) is the alkaloidal substance obtained from *Pip. longum* and *nigrum*, in colourless or pale yellow, odourless crystals, and has been recommended as a substitute for quinine in the treatment of *intermittent fevers*. It has, however, been supposed that its antiperiodic virtues depend upon impurities. It is, nevertheless, decidedly antipyretic. It possesses all the therapeutic virtues of pepper, and has been given in *gonorrhœa*, *dyspepsia*, &c., in doses of 5 to 15 grs.

Piperonal, or Piperonylic acid aldehyde, or Heliotrophine, exists as fine prismatic, colourless crystals, with a strong vanilla-like odour, which are insoluble in water. It is obtained by the oxidation of piperine, and is a powerful antiseptic, though harm-

less, and may be given in doses of 15 to 45 grs. in wafers or in wine.

Piscidia Erythrina, or Jamaica Dogwood—Hamilton has introduced the bark of the root of this leguminous plant as a substitute for opium; it causes deep sleep in moderate doses, which is not followed by any of the after ill effects of opium or morphine. It relieves pain, and it appears sometimes to act as a specific in *sciatica* and *neuralgia*, though it is generally experienced that its anodyne influence is less than that of opium, whilst its hypnotic power is greater. For *insomnia*, arising from whatever cause, dogwood appears to be a very acceptable drug, for there is reason to *hope* that it is not likely to enslave like opium. It relieves cough and spasm without affecting the centres like opium; and it has been frequently tried and reported upon favourably in *phthisis*, *bronchitis*, and *whooping-cough*. In addition to its anodyne and hypnotic qualities, it causes salivation and diaphoresis, and dilates the pupil. In medicine it is the bark of the root which should be employed, and of the fluid extract (1 oz. to 1 oz.) from 40 to 60 minim doses may be given. It should be commenced with caution as untoward effects have already been noticed, and it appears to be uneven in its action on different people. There is a resinous granular body known as Piscidin, a dry alcoholic extract, which may be given in $\frac{1}{2}$ gr. doses, and there is the ordinary extract. The liquid is the most reliable. It has been applied locally to painful *hæmorrhoids* and *burns*, and the liquid extract inserted upon wool has been used to relieve the pain of carious teeth.

Plantago Lanceolata, or Plantain or Ribbed Grass, is a common weed which has been introduced by Quinlan, who has shown it to be a hæmostatic of some value. Applied in the form of a paste made with the pounded leaf and glycerine, or as a powder of the dry leaf, or as the juice or green extract, it has been found by him to stop *hæmorrhage* speedily. He believes its action is partly vital and partly mechanical, like matico.

Po-ho-yo is an oil of peppermint imported from China. It appears to differ in no way from the English Oleum Menthæ Piperitæ in its action, though it is said to be derived from a different plant. It is used as a local anæsthetic, and has considerable pain relieving virtue owing to the large amount of menthol contained in it.

Polygonum Hydropiper, or Smart Weed, externally is a counter-irritant, and internally has been used as an emmenagogue and diuretic. It has been found, in the hands of many observers, to be a valuable remedy in *amenorrhœa* and in various

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chronic *bladder* troubles, and in *sexual debility*, in doses of 30 to 60 minims of the liquid extract.

Pongamia Glabra—The deep yellow oil expressed from the seeds of this leguminous tree, and known as Pongamia or Kurung oil, has been long used by the natives of India in *skin diseases*, and Dymock uses it in *pityriasis versicolor*, rubbed in twice a day. It has advantages in not irritating or discolouring the parts, and it may be used for parasitic skin diseases. The oil becomes solid at temperatures below 60° F. It is claimed for it that it possesses all the virtues of iodoform and chrysophanic acid in *psoriasis* and *leprosy*, without any of the drawbacks of these drugs.

Potassii Silicatis Liquor, or Soluble Glass Solution—This substance is a powerful antiseptic, and has been used (1 to 4) as an application to *erysipelas* with encouraging results. It has also been tried in *gonorrhœa*, *cystitis*, *vaginitis*, &c., but it is for its important use in making a strong, splint-like casing for broken limbs that it is used in surgical practice. Bandages soaked in this solution and applied to the limb when dry give good support. Martindale recommended a mixture of 2 parts of this solution with one of the corresponding sodium salt solution, as affording a liquid which sets quicker and more firmly than either solution separately.

Prunus Virginiana, or Wild Cherry Bark (U.S.P.)—The bark of *Prunus Serotina* (not of *Prunus Virginiana*) is a bitter *tonic*, acting on the mucous membrane of the stomach as a slight irritant, increasing its vascularity and secretion, like the older bitters, calumba, &c. This action is, however, somewhat antagonised by the tannin contained along with the bitter extractive, which at the same time confers *astringent* virtues upon the remedy. It contains also amygdalin and emulsin, which give a percentage of Prussic acid in the liquid preparations that confers *sedative* properties upon them.

The bark is much used in America, where the syrup (U.S.P.) is freely given in tea-spoonful doses to allay the cough and sweating of *phthisis*. The infusion (U.S.P.) in wine-glassful doses in *dyspepsia*, or the tincture in $\frac{1}{2}$ dr. doses is a tonic in convalescence from acute diseases. Albutt found the drug useful in cardiac *palpitation*, *mitral regurgitation*, and in *chronic bronchitis* with *fatty heart*.

Pulsatilla, or Meadow Anemone—Under this name are included *Anemone Pulsatilla*, *A. pratensis*, and *A. patens*. Shapter concludes that it acts by controlling irritability and over-activity of the ganglionic nervous system, and has no claim, except indirectly, to be classed with hellebore and aconite

as a vascular sedative. He has employed it in *eclampsia* from various causes, and found it beneficial. Clarus found that it was poisonous in large doses by causing vomiting and purging, with bloody urine, and that the respiration, cord, and medulla were paralysed.

It has, however, been given with success in spasmodic *catarrhal affections of the bronchi*, as *asthma*, and *pertussis*, and in *spasmodic dysmenorrhœa*, *amenorrhœa*, *neuralgia*, and many other affections. In catarrhal affections of all the mucous surfaces, in *small* doses it is a valuable remedy. In *acute epididymitis*, 2 minim doses of the tincture every 2 hours have given surprisingly successful results. The fresh leaves are powerfully irritant, and may even blister the skin when applied to the sound cuticle.

Shoemaker states that *pulsatilla* has been used principally by irregular practitioners, and that at present it can scarcely be said to have any status in scientific medicine. The drug is, however, in the United States Pharmacopœia, and is used upon the Continent, but it should be employed with caution. The drug is given in various eye affections, as *amaurosis*, *corneal opacities*, &c.

Anemonin, its active principle, may be given in doses of $\frac{1}{20}$ gr. in pill, or the tincture of *pulsatilla* (1 to 8) 2 to 5 minims in water.

Pyoktanin.—See Methyl-Violet.

Pyridine is a substance existing in tobacco smoke, and which may be obtained by the dry distillation of nitrogenous carbon compounds, or by the action of sulphuric acid upon bone-oil and subsequent fractional distillation; it is also one of the coal-tar products. It is supposed to be the active principle formed on the ignition of the various asthma cures. Merck's Pyridine is a colourless, powerfully-smelling liquid. It has been used with striking benefit in *asthma*. The vapour being inhaled after spontaneous evaporation, in a few minutes the breathing becomes easy, the pulse falls, and sleep follows. In chronic cases the patient may spend $\frac{1}{2}$ an hour in a small room where ℥j pyridine is placed on a plate three times a day. It is also used in *angina* and *pertussis*.

Pyridin-Tricarboxylic Acid—This allied acid may be obtained also from coal-tar. It is a crystalline substance which can be obtained by oxidising quinine with KMnO_4 . Rademacher affirms that it is a powerful antipyretic and antizymotic in *typhoid fever* and *malaria*, excelling quinine when given in 5–10 gr. doses. It is in *asthma*, however, that its most beneficial action is noticed, 2 gr. doses speedily cutting short the attack. He has also used it in *diphtheria* and other affections with reputed great advantage, but it has not come into general use.

Pyrodin.—See under Hydracetin.

Pyrogallol.—Synonym for Acid. Pyrogallic., see page 506.

Quebracho.—See Aspidospermine (page 516).

Quillaia Saponaria, or Soap Bark (U.S.P.)—The bark of this tree has been found by Kobert to contain the glucosides of senega, and he uses it instead of this drug as an expectorant, as it produces neither vomiting nor purging. He gives 2 drs. of a decoction (1 in 40). It should not be given in hæmoptysis. It contains five times as much saponin as senega, and may be used to make emulsions. Trechinski has found it of great service in acute and chronic catarrhal *rhinitis*. He directs the patient to shake up the powdered bark in a paper bag, and breathe the dust arising from it. Saponaria has been reported as most valuable in *amenorrhœa*. Saponin is the active principle, and Kobert shows that it is a mixture of a harmless substance—lactosin, with sapotoxin—a dangerous blood poison, which breaks up the blood corpuscles. Shoemaker has used soap bark with success as a local stimulant to *chronic ulcers* by applying bandages soaked in the infusion. He uses the same treatment in *hyperidrosis* and *bromidrosis*, *dandruff*, and simple *pityriasis*.

Quinetum consists of a mixture of the alkaloids obtained from the red cinchona bark. It possesses all the properties of the bark; its astringency is, however, feeble. It is a cheap substitute for quinine, and has been used in *ague*, *fevers*, and all affections in which quinine has been valuable. It is not so presentable as quinine, owing to its dirty white appearance. The sulphate of quinetum, however, is a more elegant preparation. As the substance known under the name of Quinetum consists chiefly of cinchonidine salts, which are now official, it requires little mention, as these salts should alone be employed when a cheap cinchona alkaloid is required.

Dose—Same as quinine, 1 to 20 grs.

Quinine Salts — Quinidinæ Sulphas — The neutral sulphate of an alkaloid prepared chiefly from *C. Pitayensis* (U.S.P.), in white silky crystals, not so bitter as quinine, and less expensive. This salt is very suitable for administration to children, who do not object to its taste so much as to quinine.

It is a valuable antipyretic and antiperiodic.

Dose—Same as quinine, but it is chiefly used when large doses (20 grs.) are required to bring down fever heat in *rheumatism*, *typhus*, *typhoid*, and *pneumonia*.

Quininæ Albuminas is a white amorphous substance with alkaline reaction, soluble in water, and containing, according to B-Limousin, 54 per cent. of quinine and 46 of albumen. It

was obtained by Tarozzi by decomposing sulphate of quinine by albuminate of soda. It is not decomposed by alkalies, and is said not to decompose in the system like the other salts of quinine.

Quininæ Hydrobromas (U.S.P.)—In colourless lustrous needles. 4 grs. dissolve in 1 dr. of water for hypodermic injection, which may be repeated every four hours without causing irritation.

The *Acid* hydrobromate of quinine (yellow crystals) is more soluble than the above, which is neutral. 1 dr. of water will dissolve 10 grs. of it. Where quinine cannot be given by the mouth this salt can be readily employed hypodermically. A very much smaller dose is necessary when injected into the subcutaneous tissue. It produces, whether taken by the mouth or injected, less unpleasant symptoms than the other quinine salts.

Quininæ Lactas has recently been shown by Vigier to be a salt very suitable for hypodermic administration in aqueous solution (1 in 8).

Quininæ Salicylas—This salt meets a want which the physician frequently experiences when he wishes to combine quinine with salicylic acid or its salts in *chronic* or *subacute rheumatism*, or in *neuralgia* occurring in rheumatic patients. The method of prescribing salicylic acid in a mixture with quinine often leads to the formation of an incompatible mess, which accumulates in the mixture and adheres like wax to the sides of the phial. Salicylate of quinine exists as white silky needles very sparingly soluble in water; it is best prescribed in the form of pills, 4 grs. each made up with Proctor's paste.

Quininæ Sulphocarbolas is a white powder prepared by mixing hot solutions of sulphate of quinine and carbolic acid, and may be given in pill in doses of 2 to 8 grs.

Quininæ Tannas is a salt of quinine existing as a white, almost tasteless, amorphous, insoluble powder prepared by decomposing sulphate of quinine solution with strong solution of tannic acid. It is recommended for children. Its dose corresponds to that of the sulphate.

Quininæ Valerianas (U.S.P.)—In white lustrous crystals, smelling slightly of valerianic acid. In addition to the valuable properties of quinine, this salt possesses superior power over *neuralgia* in hysterical patients. The dose should not exceed 3 grs., and should be given in pill.

Quininæ et Ureæ Hydrochloras is a very soluble quinine salt, which is the best form for giving the drug hypodermically; it contains over 60 per cent. quinine. It may be

easily prepared by combining 3 parts of urea with 20 of hydrochlorate of quinine and 12 of hydrochloric acid. It dissolves in its own weight of cold distilled water, and the solution can be injected in 5 to 20 minim doses. (See also under *Chininum Amorphum*, page 530.)

Quinolin is a new antiseptic introduced by Dormat. It is synthetically prepared from aniline. In aqueous solution 1 in 5,000 it destroys putrefactive germs, and is recommended as a gargle and spray in *diphtheria*. It is but sparingly soluble in water, but very soluble in alcohol. The salicylate and tartrate are very soluble, and may be used as surgical dressings. 1 in 2,500 prevents putrefactive changes occurring in blood, and also prevents coagulability.

Resorcin is a phenol derivative, occurring as a white crystalline powder. It was formerly prepared from gum ammoniacum and gum galbanum by fusing them with caustic potash; it is now prepared from benzole. It closely resembles carbolic acid in its properties, and is a powerful antiseptic. 1 in 100 prevents putrefaction; 2 in 100 is not irritating when applied to wounds. Given internally large doses (30 grs.) cause giddiness, dyspnoea, and perspiration; 60 grains have caused collapse and coma and a fall of temperature. Its use as an antipyretic should be discontinued, as it is dangerous and uncertain. 5 gr. doses have produced splendid results in *ulcer of the stomach* and in *sea-sickness*.

In the *diarrhœa of children* small doses (1 gr.) have achieved good results. It has been given in *ague*, but the large doses which are necessary in this disease are dangerous.

Andeer has found it of great use in *laryngeal* diseases. It acts as a local anæsthetic in these cases, and if applied in concentrated form it becomes a safe and painless caustic very acceptable in *tubercular laryngitis*.

Externally or locally it possesses great absorptive powers over new cell infiltrations, as *lupus*, *epitheliomas*, &c. In *labial epithelioma* the powder causes speedy cicatrization, and even in uterine and rectal cancer benefit is for a time noticed when the powder is dusted over the growths, where it acts as an efficient painless cautery; the strong solution is also caustic. It has been proved useful in *diphtheria*; the powder may be applied to the throat, or a 50 per cent. solution may be used as a swab or spray. *Hay fever*, *whooping-cough*, and *laryngitis* may be similarly treated. Excellent results have been obtained in whooping-cough by using a spray or painting the throat and fauces with a 1 to 2 per cent. aqueous solution. In both this disease and diphtheria it may be administered internally at the same time. A solution (1 in 50) may be injected into the bladder in *cystitis*, and a 1 to 2 per

cent. solution may be used in *ophthalmia*, *otitis*, *gonorrhœa*, and *leucorrhœa*. Externally the same solution is of great value in *chronic eczema*, *ulcers*, *wounds*, and *sores*. 2 to 5 per cent. in *erysipelas*, and 20 per cent. in *psoriasis* and *parasitic skin diseases* have been valuable.

Retinol.—See Rosinol.

Rhigolene, or Amyl Hydride, is a light hydrocarbon obtained from petroleum, which has been found by Richardson to produce local anæsthesia by reducing the temperature through its rapid evaporation. He found that a mixture of 1 dr. of camphor and 1 of spermaceti dissolved in 2 ozs. of rhigolene applied on cotton wool to burns produced rapid relief from pain by its evaporation, and there was left a safe protective coating upon the injured surface, which acted the part of an impervious dressing. Iodine dissolved in rhigolene, making a 1 per cent. solution, affords an excellent means of depositing this antiseptic and alterative substance in a state of minute subdivision upon the face of a foul discharging or *syphilitic sore*. Stabler found that the spray produced from a mixture of rhigolene and expressed oil was absolutely unirritating, and could be sprayed into the throat. He finds that all essential oils and turpentine, salol, menthol, &c., can be sprayed in this way. The extreme inflammability and very unpleasant odour of rhigolene are the great drawbacks to its general use. It is also known under the names Hydramyl, Pentylene, and Pentyl Hydride, and enters into Amyl Colloid mentioned upon page 512. The article supplied as Rhigolene is often impure.

Rhinacanthus Communis—The leaves of this popular Chinese and Indian plant when bruised and mixed with lime juice are a prized remedy for *ring-worm* and *parasitic skin affections*. The tincture of the root is used as an application to chronic *eczema*, *tinea*, and *psoriasis*. It is known as *Hong-Pang-Chong*. Internally it has feeble antiperiodic and tonic powers like quinine.

Rhus Aromatica, or Fragrant Sumach, is an American plant possessing astringent properties, which have given it a favourable place in the estimation of many in *cystitis*, *hæmorrhage*, *night-sweats*, *hæmaturia*, *menorrhagia*, *diarrhœa*, and *dysentery*. Its pharmacology is not clearly understood, but it appears to have some selective action upon the urinary tract, to which it is a tonic; the resin which resides in the root-bark is probably eliminated by the kidneys.

Excellent results have followed its administration for the *nocturnal incontinence of urine*. Unna declares that it is a specific for this condition, acting upon the muscular fibre of the bladder. Under 2 years he gives 5 minims of fluid extract night and morn-

ing, and between 2 and 10 years 10 minims; and continues its use after the symptoms disappear.

Dose—Of the liquid extract—(1 in 1) 20 minims every two or three hours, or after each loose motion; or $\frac{1}{2}$ drachm three times a day, and 1 drachm at bed-time in *enuresis*.

Rhus Toxicodendron, or Poison Ivy (U.S.P.)—The fresh leaves of this plant cause great cutaneous irritation and inflammation even upon slight contact in some people, often great œdema and pain supervening. Internally, in large doses similar action appears to be excited in the stomach and intestines, and even the emanations from the plant produce eczematous eruptions. It possesses properties like the preceding remedy, when given in minute doses—2 minims of tincture (1 to 8) diluted, and it has been administered for *incontinence of urine* and *atony of the bladder*. Externally it has been used in *rheumatism* and *eczema*, and the juice has been applied as a caustic to hard *cancers*.

Internally the drug has been vaunted in *rheumatism*, but Wood, after extensive trial, found it unreliable and incapable of giving any definite good result.

Rosinol, or Retinol, Resinol, or Oil of Resin, is an oily hydrocarbon, with a faint, peculiar odour, and slightly bitter taste, non-saponifiable, and unirritating. It is obtained by the dry distillation of resin, and is of very complex chemical composition. It is powerfully antiseptic, and in the hands of many observers excellent results have been obtained in a large number of different diseased conditions. It can be applied upon lint saturated with it and kept in contact with *ulcers* and *putrid* wounds, and as a local application to the vagina in *leucorrhœa*, and in *cancer of the uterus*, and in *metritis*.

Made into an ointment with half its weight of lanoline it has been applied to the conjunctiva in catarrhal conditions, and, used in the same proportions, it has been employed in *eczema*, *impetigo*, *scabies*, *hæmorrhoids*, &c. It has been brushed over the false membrane in *diphtheria*.

Internally it has been given in tea-spoonful doses in *fevers*, *bronchitis*, *rheumatism*, and *gonorrhœa*. Capsules afford the most convenient form for administration.

Its greatest value, however, lies in the fact that it can be mixed with a great number of drugs already found useful in skin therapeutics, and it makes a stable, unirritating base for ointments. It dissolves Peruvian Balsam, Naphthol, Camphor, Salol, and many other agents.

Rubus Chamæmorus, or Yellow Raspberry, is a plant used in Northern Russia as a diuretic and diaphoretic. The entire plant is active. Popoff, though unable to find an alkaloid, was able to isolate an acid from the dried berries. This acid forms

crystalline salts freely soluble in water. It is claimed for it that infusions prepared from the flowers, leaves, and berries, act as reliable diuretics by stimulating the kidneys without affecting the heart or blood pressure. The drug has been given by Frinkowski and Bouchoneff in *Bright's disease* and *hepatic dropsies* with success. The dose is $\frac{1}{2}$ oz. of a 1 in 10 infusion three or four times a day.

Rumicin, the eclectic preparation obtained from *Rumex crispus*, or Yellow Dock—It is vaunted as possessing astringent and aperient qualities like rhubarb, and alterative and tonic virtues in doses of 2 to 5 grs., in pill. It contains chrysophanic acid, and has been given internally in *psoriasis*, *chronic laryngitis*, *scrofula*, *dyspepsia*, and *hepatic diseases*.

Sabal, or Saw Palmetto, is a plant growing in the Southern States of N. America accredited with a long list of very marked therapeutic virtues in a host of ailments. It appears, however, to really possess expectorant properties, and has been given with benefit in various forms of *bronchitis*, *nasal catarrh*, *asthma*, *phthisis*, and *laryngitis*. The fruit is the most active part of the plant. Some idea of the difficulty in forming any opinion of the value of the recent reports upon this drug may be judged from the fact that it has been vaunted as a remedy for *atrophy* of the testicles and mammary glands, and *hypertrophy* of the prostate.

Safrol—Oil of sassafras consists of about 90 per cent. of this substance, the remaining 10 per cent. being terpene with a little eugenol. It may also be obtained from camphor oil. Safrol has been given in doses of 20 to 30 drops in *acute* and *subacute rheumatism*.

Salbromalide, or Antinervine, is a colourless, crystalline powder, consisting of a mixture of salicylanilide and bromacetanilide. The German preparation is obtained by mixing bromide of ammonium, salicylic acid, and antifebrin. It is also known under the name of Salicylbromanilide, and it is claimed for it that it possesses the virtues of bromides, salicylic acid, and antifebrin. Its action has been studied by Bradfute, who corroborates the above view of its value, and he obtained satisfactory results from it in *typhoid fever*, *acute rheumatism*, *neuralgia*, and *phthisis*, as an antipyretic and analgesic. He found it to diminish arterial tension, and he suggests that it will prove a valuable depressor in acute inflammation in robust patients. It may be given in tabloids or wafers in doses of 3 to 5 grains.

Salicylamide exists in small, tasteless, colourless crystals. It is the amide of salicylic acid obtained by acting upon the oil of wintergreen by strong ammonia. It acts like a concentrated

salicylic acid, and is reputed to have a much stronger analgesic action. Its dose is only 5 grains, and this amount is soluble in about three table-spoonfuls of water. It is used in *acute rheumatism* and in *migraine*.

Salinaphthol, or Salicylate of Naphthol, is a white, inodorous, tasteless solid, which is insoluble in water. It is prepared by combining salicylic acid with *beta*-naphthol. It is also known under the names of Naphthalol, Naphthosalol, and Betol, under which latter name its therapeutic properties are described upon page 519.

Salipyrine is a white, crystalline, odourless powder, prepared by the action of antipyrine upon salicylic acid; it is almost insoluble in water. It can be readily prepared by mixing a watery solution of antipyrine with an ethereal solution of salicylic acid. It has been recommended by Spica as a remedy in *acute rheumatism*, and Monsengeil extols it in *influenza*. It has been used successfully in nearly every disease or feverish condition where antipyrine is indicated. Guttman found it valuable also in *chronic rheumatism* and *neuralgia*, and he gave it in large doses for many days without witnessing any unpleasant effects, save an exanthematous eruption in one case. It may be given in tabloids or wafers in doses of 10 to 30 grains three or four times a day. According to Guttman it has only half the antipyretic strength of antipyrine.

Salix Nigra, or Black Willow—Many observers, including H. Fenwick, have used this remedy as a sexual sedative, and report most favourably of it. It has been given in *ovarian hyperæsthesia*, *seminal emissions*, and *urethral neuralgia*. Drs. Paine and Hutchinson report most favourably upon its action as a sedative in *uterine* and *ovarian pain*, and in *hemicrania*, and excellent results have been obtained in *facial neuralgia*, *hysteria*, and *nymphomania*. The bark, root, and buds, are made into a fluid extract 1 in 1, of which $\frac{1}{2}$ to 1 dr. may be taken three times a day.

Salol, or Salicylate of Phenol, is a white, crystalline, tasteless, insoluble powder, with very faint aromatic odour. It is prepared by the action of salicylate and carbolate of soda upon each other in the presence of phosphoric oxychloride. It is not decomposed in the stomach, but is changed immediately upon entering the bowel, when it comes into contact with the pancreatic juice, which splits it up into salicylic acid and phenol compounds, and it appears at once in the urine as salicyluric acid; Ewald measures the rate at which food passes through the stomach by this means. Salol in large doses causes the urine to become black, and it may produce symptoms of carbolic and salicylic acid poisoning.

Nevertheless, it is very much safer than proportionate amounts of these acids, and has been given in 15 to 30 gr. doses in *fevers* without ill effects. After such a dose there may be noticed a drop in the temperature of 5° . It is in *acute rheumatism* that salol has proved a most valuable drug, and its action is allied to salicylic acid in this disease. Innumerable reports testify to its success in acute and chronic rheumatism, *sciatica*, *neuralgia*, and *lumbago*, *cystitis*, *pyelitis*, and *phthisis*, and it possesses analgesic properties like antipyrine, in *migraine*, *ataxy pains*, &c. Its internal use in putrid conditions of the urine is like that of boracic acid, and prevents the necessity of bladder injections or irrigation. It is used as a duodenal and intestinal disinfectant, and as a solvent for gall stones, as it liquefies the bile; it is given also in *catarrh of the bile ducts*, and has been used locally as a mouth wash, and spray, and application to wounds. 15 grs. may be considered a fair average dose, and it may be repeated every 4 hours; it can be given in tabloids or suspended in water or in wafer paper. Externally, it can be used exactly like iodoform, and it is maintained by many that it will replace that drug. It contains about 38 per cent. of phenol.

Salol Camphor is a thick liquid prepared by heating together 2 parts of camphor and 3 of salol. It has been used externally as an antiseptic, and taken internally in small doses. By dissolving 2 drs. salol in 2 drs. ether and 2 oz. collodion a thick liquid is obtained, which has been painted over the joints in rheumatism with benefit.

Salophen is a body of similar composition to salol; it contains 51 per cent. salicylic acid, and is given in similar doses. It is stated that it is less likely to cause phenol poisoning.

Salud is the name by which the fluid extract of *Jacaranda lancifoliata* is known, see page 562.

Sanguinaria Canadensis, or Blood Root (U.S.P.)—The rhizome of this perennial plant has been found in full doses to act as a powerful emetic, causing purging, salivation, dilatation of the pupils, collapse, and death, preceded occasionally by convulsions, and a marked rise afterwards followed by a more marked fall in arterial tension and pulse. Reflex excitability, respiration, and muscular contractility are diminished.

Sanguinarin the active principle, has been used with some success in *bronchitis* and *pneumonia*. It acts as a valuable stimulating expectorant in *chronic bronchitis*, and in small doses ($\frac{1}{12}$ to $\frac{1}{8}$ gr.) it does so without irritating the stomach. In still smaller doses ($\frac{1}{20}$ to $\frac{1}{12}$ gr.) it may be given for *atonic dyspepsia*, as it increases the secretions of the stomach and intestines. It has been tried in *febrile* conditions for its sedative action upon the vascular system, but, as it only acts in this way in full doses

($\frac{1}{2}$ to 1 gr. or more), which cause much irritation of the stomach, it is inferior to hellebore, aconite, and other remedies.

It acts as an emmenagogue, and has been given in functional uterine ailments, but it is dangerous, and should be discarded for this purpose. The dose of the U.S.P. tincture is 30 minims, or of the fluid extract 5 minims.

Santoninoxim is a substance in white, silky crystals, soluble in alcohol, which is prepared by heating 5 parts santonin with 4 parts hydrochlorate of hydroxylamine and 4 parts carbonate of calcium with alcohol. Upon filtering the boiling liquid, and adding 5 times its bulk of boiling water and cooling, this substance crystallizes out. Cappola claims that it can be given in doses three times as great as santonin without the risk of producing any toxic symptoms, and it kills the worm whilst santonin is said to only paralyse it.

Saponin.—See *Quillaia Saponaria*.

Scopoleine is an alkaloid obtained from Japanese Belladonna root (*Scopolia japonica*), introduced by Pierd'houty to cause rapid, painless, and persistent dilatation of the pupil. Contrasted with atropine, he found the greatest degree of mydriasis and paralysis of accommodation produced in a little more than half the time required for the full action of atropine. It lasted much longer, and was not overcome by eserine. Recent reports speak highly of the drug. Dunn finds it much superior to atropine for *keratitis*, *corneal ulcers*, and *iritis*.

Scopolia Carniolica has been used by Duckworth and others as a remedy for *sweating* and *palpitation*. It contains hyoscyamine, and is less objectionable than belladonna. The fluid extract may be given in 5 min. doses. The root has been recommended instead of belladonna for all the preparations usually made with belladonna.

Siegesbeckia Orientalis is an herb which has been long used in the Mauritius as an internal alterative remedy in *gout*, *syphilis*, and *scrofula*, and as an external application to sloughing sores. Dr. J. Hutchinson has reported most favourably upon the use of the drug in *ringworm*. He used a tincture procured from Mr. Christy ($2\frac{1}{2}$ oz. to 1 pint), and the tincture was mixed with an equal quantity of glycerine, and rubbed well into the affected parts morning and night; all the cases yielded rapidly to this treatment. An active principle has been isolated, and called Darutyne. For internal use 2 drs. of the 1 to 8 tincture of the herb may be given.

Simulo is the fruit of *Capparis coriacea*, and it has been used by Drs. White and Eulenburg in *epilepsy*. The remedy has given satisfactory results though none of the cases were cured, and it may be expected that the drug upon further trial may be

found a valuable auxiliary treatment to the bromides. The dose of the tincture (1 in 10) is 1 to 2 drs. The drug has been more recently tried by others, and the reports of its value differ widely. It has been useful in *hysteria*, and Poulet speaks highly of its efficacy in *ovarian* troubles associated with *hysterical* symptoms.

Sodii Tannas is recommended by Lewin instead of tannin in *chronic albuminuria*, to lessen the amount of albumen. The experiments of Ribbert, who produced artificial albuminuria in rabbits, by ligature of the renal artery, show that scarcely any albumen was found in the glomeruli when tannate of sodium was injected into the veins.

Administered in doses about the same as of tannin, it has been found to sometimes produce great gastric disturbance, and sometimes diarrhoea. It is advisable not to administer at first more than 5 grs.

Solanin is a glucoside obtained from the shoots and parings of young potatoes, from the berries of *solanum nigrum*, and from different parts of many solanaceous plants. It possesses decided analgesic and local anæsthetic action, and has been used hypodermically in *sciatica*. Firopé found that it caused profound cerebral and spinal depression, causing anæsthesia and paralysis, and moderating reflex action. Capparoni gives it in doses of 2 to 4 grs. In all cases where it is necessary to reduce spinal irritability and in *asthma* it should not be given hypodermically, as it causes local irritation. It has no effect upon the pupil or brain. There is much uncertainty about this remedy, and it is probable that different observers have been using different glucosides or alkaloids in different degrees of purity from various members of the solanaceæ. One writer lauds it as a valuable substitute for morphine, as it does not cause cerebral congestion, whilst another condemns it as uncertain and highly irritating to the tissues, and only analgesic in dangerous doses. One reporter gives it in doses of $\frac{1}{20}$ gr., whilst another administers 4 grs.

It has recently been administered for its soothing effect in *bronchial irritation*, *cardiac asthma*, *whooping-cough*, *rheumatism*, *gout*, *cystitis*, and many other affections in the form of the hydrochlorate, in doses of $\frac{1}{4}$ to $\frac{1}{2}$ gr. hypodermically in aqueous solution.

Solidago, or Golden Rod (*Solidago odora*) is a North American plant with a fragrant anise-like odour, which enjoys a popular reputation as a carminative and diaphoretic, and as an antispasmodic in dysmenorrhœa. The essential oil is the active principle of the plant, and may be given in doses of 2 to 4 minims.

Solidago Virgaurea resembles it in most respects and possesses diuretic properties which have rendered it useful in *chronic*

cystitis and *atony of the bladder*, in which affections Dr. G. F. Wales has obtained good results from wine-glassful doses of an infusion (1 in 20) four times a day.

Solveol is a dark brownish, black liquid, allied to Lysol. It has been used as an antiseptic upon the Continent, especially in Germany. It contains as its active principles a number of cresols. The meta- and para- cresols are less toxic than phenol and more active. It also contains a large amount of cresotate of soda, probably in the form of para-cresotate. It mixes with water and may be used in 1 per cent. solution as a lotion for wounds, or disinfectant for instruments.

Somnal, or Ethyl-Chloral-Urethane, is a colourless liquid with a faint chloral-like odour, formed by the combination of alcohol, chloral, and urethane. It was introduced by Radlauer, and has been proved to possess valuable hypnotic qualities in doses of 30 to 40 minims in sherry or sweetened tincture.

Its effects begin in 30 minutes, and produce sound refreshing sleep lasting 6 or 8 hours. It is claimed for it that it does not interfere with the digestion, respiration, or circulation, and Gilman Thompson states that it is far less depressing than chloral, and that in the above mentioned doses it is a safe and reliable hypnotic for ordinary insomnia. It will be thus seen that it closely resembles chloral in its therapeutic action, but it yet remains to be demonstrated that it is free from the dangerous, depressing effects upon the heart. To say that it combines the virtues of urethane with those of chloral, is to say little in its favour.

Somniferin is the name given to a new hypnotic, narcotic, and analgesic, existing in fine transparent crystals. It is a morphine ether introduced by Bombelon. It closely resembles morphine in all its actions, and it is said not to produce headache, itching, constipation, or malaise. The dose is slightly smaller than that of morphine salts.

Soziodol, or Diiodparaphenolsulphonic Acid, is the name given to a new antiseptic in white crystals, devoid of odour. It is prepared by acting upon phenolsulphonic acid with iodine, and it contains 7 per cent. sulphur and 52 per cent. iodine. There are two soziodols—(1) Iodparaphenolsulphonic Acid, which is only slightly soluble, and (2) Iodophenolparasulphonic Acid. The substance used in medicine as soziodol is an acid sodium salt of the first acid. There are also soziodols of potassium, of mercury, of zinc, lead, ammonium, aluminium, silver, and barium; several of these have been recommended and used as substitutes for iodoform.

Lassar has used sozoiodol in skin diseases, in a 5 per cent. powder, paste,* or ointment, with zinc, starch, and vaseline or lanoline, and finds that it rapidly cures *chronic eczema*, *tinea*, *impetigo*, and *ulcers*. It resembles, in his opinion, salicylic acid, but is less irritating. Other observers have utilised its powerful antiseptic qualities in the treatment of *lupus*, *gonorrhœa*, *syphilis*, *ozæna*, and *tubercular laryngitis*. It has been employed in every case where iodoform has been tried, and may be freely dusted on all ulcerated surfaces. It has been administered internally in *stomach* affections in doses of 15 grs. thrice daily, and it is claimed for it that, unlike iodoform, it is perfectly safe and non-poisonous.

Sparteine is the active principle of broom ; it is a colourless liquid alkaloid, which forms crystallisable salts, and it is the sulphate which is generally administered in medicine. It powerfully depresses the nerve centres and paralyses respiration, but never in the doses ordinarily administered. It has marked effect upon the heart like digitalis, and innumerable reports from the highest authorities show that it is a cardiac tonic of great value, especially as it may be regarded as free from the dangers attending large doses of digitalis and strophanthus. Professor Leech, who has studied the action of the remedy in failing heart power, speaks very highly of its value, and he has proved its freedom from toxic effects by taking 5 grs. himself. Levascheff, Prior, Maslowski, Fick, Laborde, Masius, G. Sée, and others, have demonstrated that it raises the blood pressure, increases the force of the ventricular contractions, and regulates the rhythm, but that upon the whole it is less powerful than digitalis, and, though there are very diverse opinions about the diuretic properties of the drug, it can, however, be affirmed that its diuretic action is feeble and uncertain at the best and inferior to digitalis. So that, generally speaking, sparteine may be regarded as a valuable addition to therapeutics, chiefly indicated where digitalis cannot be given, or in the intermissions during a prolonged digitalis course, or in mild cases of cardiac diseases, or in cases of comparatively recent origin. It has been given in *asthma* and *Graves's disease*. There is much confusion about the dose ; 1 gr. three times a day is a fair medium dose. Gluzinski states that small doses ($\frac{1}{3}$ gr.) act better than larger quantities. It has at least one advantage over digitalis in its rapidity of action ; 30 minutes after its administration its effects are produced. The writer believes that, combined with strychnine, it is the most reliable drug for combating *urgent* symptoms suddenly arising from failing compensation in valvular lesions.

* The substance known as Lassar's Paste does not contain sozoiodol. It consists of salicylic acid 2 parts, oxide of zinc 25 parts, powdered starch 25 parts, and vaseline 50 parts. It is very valuable in eczema.

Spermine—Much has been written under this heading in the current literature of medicine during the past few years. Since Brown-Séquard made the remarkable report about the therapeutical powers of a hypodermic administration of emulsion prepared from the testicles of young mammals, many pharmacologists have been at work in isolating the active principle of the emulsion. This is proved to be an organic base, the phosphate of which was discovered by Charcot and Robin in 1853 in the spleen in leukæmia, and which has been since recognised by a host of observers in the blood and various organs. Schreiner obtained this crystalline phosphate from semen, and from the testicles of the bull, and liver of the calf, and later still, Ladenburg prepared an identical body from ethylendiamine. Piperazine was introduced under the name Spermine at first, but it is certain that it is another substance entirely and possesses different physiological action.

Poehl's spermine, prepared from the testicles and prostates of young bulls and horses, and Brown-Séquard's emulsion have been tested by many observers, who have employed them in various diseased conditions, as *impotency*, *premature senile decay*, *phthisis*, *insanity*, *scurvy*, *diabetes*, &c. The reports vary considerably, but agree in the main that the hydrochlorate of spermine prepared by Poehl and the emulsion are practically identical in their action and cause powerful stimulating effects upon the heart, digestion, nerve cells and muscular system, and upon general metabolism. Some of the reporters prophesy that brilliant results may be expected from this new remedy in various diseases, but at present its preparation and chemical composition, as well as its pharmacology, require much further investigation. (See also under Piperazine).

Spigelia, or Carolina Pink (U.S.P.)—The rhizome and root-lets of *Spigelia marilandica* (Maryland Pink) in the form of a fluid extract (I in I) are used in America as a remedy for the round-worm. It appears to be almost as satisfactory as *santonin*. It is mildly purgative, and, like *santonin*, its effects are increased if coupled with or followed by a purgative; 1 tea-spoonful of the fluid extract may be given with a table-spoonful of syrup of *senna*. *Stillé* recommends its administration in combination with *senna*, *fennel*, and *manna*.

Spleen Pulp—Maragliano has used this agent in *anæmia* and *chlorosis* with, apparently, very satisfactory results. He uses the following combination—the entire mixture being administered in 24 hours—spleen pulp 4 ozs., brandy 2 ozs., almond emulsion 10 ozs.

Stigmata Maidis.—See *Zea Mays*.

Stillingia Sylvatica, or Queen's Root (U.S.P.), has been used in America as an alterative in *syphilis* and *struma*.

It is a sialagogue, and when swallowed appears to increase the secretions of the gastric and intestinal glands by a mild irritant action ; the liver is stimulated to secrete more bile, and if the dose be large, vomiting and purging supervene. The urine is increased, and the bronchial secretion is augmented.

It has been given in *ascites*, caused by *cirrhosis*, in *hæmorrhoids*, and in chronic *constipation* and *jaundice*, and in various *strumous* ailments.

Dose—Of the fluid extract (1 in 1) 20 minims to 1 dr., or of Stillingin (its eclectic extract) 2 to 4 grs.

The Compound Liquor, known as M'Dade's Succus Alterans, is used as an antisyphilitic agent, and, according to Martindale, consists of fluid extracts of smilax, stillingia, lappa minor (burdock), and phytolacca, of each 2 ozs.; and tincture of Xanthoxylum (prickly ash), 1 oz.; it is given in doses of 1 to 4 drs. three times a day.

Strontium—The lactate of strontium has recently been much praised as an agent for *albuminuria*. D-Beaumetz speaks most highly of its powers of diminishing the amount of albumen in the urine in chronic Bright's disease. It is stated upon good authority that this is the only drug which can be relied upon for this purpose. It may be given in doses of 20 to 30 grs. three times a day. The writer has had the opportunity of trying it in some unpromising cases, and though it diminished the quantity somewhat at first, it appeared to possess little power over the disease. His experience, however, is too short to speak definitely of its value. It certainly should have a good trial, and it is free from danger. It may be given in solution in water.

Styracol is a crystalline substance in long needles ; it is the cinnamic acid ester of guaiacol from which it is obtained. It is introduced as a substitute for guaiacol, being much more agreeable in odour and taste. It possesses powerful antiseptic properties, and has been given internally in chronic *cystitis*, *gonorrhœa*, *phthisis*, and catarrhs of the stomach and bowels, and in every condition in which creasote or guaiacol are indicated.

Sulphaminol, or Thio-oxy-di-phenylamine, is a yellow, tasteless, odourless powder insoluble in water, prepared by the action of salts of metaoxydiphenylamine upon sulphur. It is claimed for it that it possesses all the virtues of iodoform without its objectionable qualities, and it is, moreover, perfectly harmless in enormous doses. Kobert gave very large quantities of this new antiseptic to dogs without being able to produce any unpleasant symptoms. In contact with pus and the secretions from wounds

and sores it splits up into sulphur and phenic acid. Moritz used it as a dry dressing to suppurating wounds, and found it to act most powerfully in diminishing the discharge. It has also been used as an insufflation in *laryngeal phthisis* and nasal discharges, and it is reported that internally in doses of 4 grs. it has proved beneficial in cystitis and other ailments.

Sulphocarb.—See Aseptol.

Sulphuretted Hydrogen was introduced by M. Bergeon as a destroyer of the tubercular bacillus in cases of *phthisis*. He administered the gas by the bowel, and diluted it with carbon dioxide. His apparatus consists of a gallon bag of caoutchouc, filled with CO_2 , and connected with a Wolffe's bottle, which is attached to a tube and nozzle for introduction into the rectum. The Wolffe's bottle being filled with a natural sulphuretted water, the compression of the bag causes the CO_2 to bubble through the H_2S water and pass on into the intestine of the patient. The gallon ($4\frac{1}{2}$ litres) of CO_2 was used at each administration after bubbling through 10 oz. of the H_2S mineral water. This was done twice daily. Other apparatus has been used by different experimenters, but the principle is the same. It is claimed that under this treatment the fever, cough, and expectoration diminish, and the appetite and weight increase. In *bronchitis* and *asthma* good results have been recorded. It appears, however, that the benefits obtained from this treatment in *phthisis* are in no way due to the toxic action of the gas upon the bacilli, and Wood has remarked that there is no proof that H_2S has any toxic action upon disease germs. D-Beaumetz tried the CO_2 and found it fail, and affirms that the good results come from the action of the H_2S , whilst Dupont states that even Bergeon acknowledges that it is the CO_2 which is of value, and Bergeon now advocates the use of rectal injections of CO_2 without any admixture of sulphuretted hydrogen. Probably the explanation may be found in the valuable expectorant action of the H_2S upon the bronchial surface, as the writer found many years ago that there was no more valuable expectorant than a diet of onions. There is no lessening of the bacilli during the gaseous administrations. Wood uses a rectal injection of a concentrated aqueous solution of the gas, and the old method of drinking natural sulphuretted waters is coming into use again. Accidents have already occurred with the gaseous injections, as H_2S is a strong poison. M. Morel states that 25 c. centimetres are a fair dose—that is, a little under the bulk of a fluid ounce. Battesti advocates in *chronic bronchitis* and *asthma* the administration of monosulphide of sodium, $\frac{1}{5}$ gr. in solution, followed by a glass of seltzer water, fasting. Bocquillon recommends the hypodermic injection of vaseline oil saturated with sulphuretted

hydrogen. Ichthyol internally is enjoying a good reputation in *bronchitis* and *phthisis*.

Tayuya, or *Trianosperma ficifolia*, is a Brazilian cucurbitaceous plant, whose root contains an alkaloid known as Trianospermine. It is a powerful hydragogue cathartic, used in dropsies. 4 grs. of the powdered root may be given in pill, or a corresponding quantity of an infusion may be administered. It is also believed to possess some power in tertiary *syphilis* and inveterate chronic *eczema*.

Tellurate of Potash is obtained by acting upon a solution of tellurate of barium by sulphate of potash. It is given in *phthisis* by Neusser, who found that it had a powerful effect upon the tubercular bacilli. He reports that its administration in a large number of cases always reduced the night sweats. The onion-like odour which it imparts to the breath is a serious drawback to its use. $\frac{1}{6}$ grain may be given twice a day in the form of a pill.

Terebene is a powerful antiseptic, disinfecting, and deodorising liquid, with an agreeable balsamic odour, and very complex chemical composition, consisting of borneol, terpine, camphene, and cymene. It is prepared by the action of sulphuric acid on turpentine and subsequent distillation. It is used in *phthisis* mixed with thymol and carbolic acid in equal proportions as an inhalation ($\frac{1}{2}$ dr. to 1 pint of hot water), or sprinkled over wool in an antiseptic respirator.

Internally, it has been given with success in *chronic bronchitis* and *winter cough*, by Murrell, as a stimulating expectorant, and the writer has often seen its benefits in these troublesome complaints, especially when *emphysema* is present. It acts like eucalyptus when used as a spray, and is said to exert its good influence over the urinary and gastro-intestinal mucous membranes; and Betrin reports that applied freely on pledgets of lint and kept in contact with uterine epitheliomas, splendid results are obtainable.

15 to 20 minims, in thick syrup or in capsules, may be given three times daily.

The cheap disinfectant liquor sold under this name is a valuable deodoriser for the sick room.

Terpene, or Terpene Hydrate, occurs in colourless, prismatic crystals, obtained by acting upon a mixture of turpentine and alcohol with nitric acid. It is found to be a good expectorant, and has been used by Ferreira, Rabou, Masius, and many others in *bronchitis* and various lung diseases. It increases and liquefies the expectoration in doses of 3 grs., in pills. In larger doses it acts as a diuretic, and has been used with success in various *bladder* affections. It is stated that it reduces the number of the attacks in *whooping-cough* and that it stops *hæmoptysis*.

Lepine speaks highly of the therapeutic virtues of both terpine and terpinol, which he thinks should replace terebene and turpentine.

Terpinol is an oily, aromatic, liquid, colourless body, prepared by treating terpene with acids. It is, like terpene, insoluble in water, and is used as an expectorant, given in capsules or pills, or per rectum, in doses of 10 to 20 minims.

Tetronal, or Diethylsulphondiethylmethane, is a body existing in tabular, odourless, shining crystals, which is closely allied to sulphonal. Barth and Rumpel have administered it in a large number of cases as an hypnotic, and they say its indications are the same as those for sulphonal, but in some very obstinate nervous conditions it has given better results, though it was useless in *delirium tremens*. In 220 cases its administration was not followed by any unpleasant after-consequences. 10 grs. may be given morning and evening in the form of tabloids.

Thalline, or Tetrahydroparamethyloxychinoline, is a synthetically prepared basic substance introduced by Skraup. It has been proved to possess marked antipyretic properties resembling, in some respects, quinine, antipyrine, and kairine, when given in doses of 2 to 4 grs. It produces no unpleasant after-effects, and causes a fall of temperature nearly as rapid as antipyrine—*i.e.*, in about 3 hours; but the fall lasts a much shorter time—generally about 5 hours, while the effects of antipyrine may last twice this period. The sharpness of the fall and the early ascent, ushered in, often by rigors, are somewhat characteristic of thalline. It appears to possess only slight depressing effect upon the heart, and often copious sweating follows its use, though this cannot be regarded as an explanation of its temperature-reducing properties, since sometimes it produces a marked fall without any action on the skin. In *typhoid fever*, in *phthisis*, and in *tuberculosis*, as is the case with antipyrine, the best results have been obtained. Dujardin-Beaumetz found that thalline caused a destruction of the red blood corpuscles, and he has been corroborated in this by other observers. Thalline may be found by further observations to possess superior powers as an antipyretic, but at present it offers no advantages over antipyrine. It may be given in doses of 5 grains every 5 hours. Already one death has been attributed to its use, and this followed a dose of 9 grains.

Recently, Ehrlich has published glowing reports of the value of thalline in *typhoid fever*, in doses of 2 to 3 grs.

Recently, Goll, of Zurich, has used salts of thalline with striking success in *gonorrhœa*. He gave the drug internally, and used a bougie containing 3½ grs. of the sulphate thrice daily; or injec-

tions of a 2 per cent. solution were employed. Many observers have corroborated his statements.

Demme has introduced a body of similar composition to thalline. It is Methyl-tri-hydro-oxychinoline-carbonic-acid, and he gives 15 to 20 grs. of the soda salt in diseases in which the new anti-pyretics are indicated.

Theine—The alkaloid of tea (*Thea sinensis*) is identical with Caffeine (which see).

Dose—2 to 6 grs., in a mixture or pill.

Maté, or Paraguay Tea. *Ilex maté*, or *ilex paraguariensis* and other species of *ilex* yield about $\frac{1}{2}$ per cent. of caffeine. (See page 571.)

Khat, Cafta, or Arabian Tea. *Catha edulis* is used by the Arabs, who generally chew it to produce a form of very mild intoxication or sensation of cheerfulness and hilarity, accompanied with great watchfulness and wakefulness. Its active principle is identical with theine or caffeine.

Theobromine.—See Diuretin, page 538.

Therpylene Hydras—M. Boursier has prepared a substance by distilling the young buds of various species of pine, which he designates as Hydrate of Therpylene. It resembles turpentine, and is saturated with oxygen, and is rich in ozone. Labbé has tried it therapeutically, and finds it to be a powerful antiseptic, disinfectant, and deodoriser, which can be used with advantage as a surgical dressing to *fresh wounds* and *ulcers*, or as an application to destroy the fetor caused by the decomposition of the false membrane in *diphtheria* or as a disinfecting spray in the sick room.

Thiol exists in dry scales, or as a strong solution of these. It is prepared from ordinary gas oil, and in its properties it closely resembles ichthyol, for which drug it has been recommended as a substitute in chronic *scaly skin diseases*, *eczema*, &c. It has been used by Gothchalk (1 part in 5 of glycerine) as an application to the ulcerated cervix uteri, and it has given good results in *burns*, *erysipelas*, &c., applied as an ointment of the same strength. It possesses the advantage over ichthyol in being odourless. It has been given internally in similar doses; thus 5 grs. of the *dry* thiol may be given three times a day in pill. 1 dr. of the *liquid* thiol to 1 oz. vaseline is the usual strength for ointments in *eczema*, &c.

Thio-Resorcin and Di-iodo-thio-Resorcin are amorphous substances, the former of a pale yellow, and the latter of a brown colour. They are compounds of resorcin with sulphur, insoluble in water, and have been introduced and used as substitutes for iodoform, which they closely resemble. It is claimed for them that they are innocuous and free from unpleasant odour. They

may be applied as a powder or as an ointment (1 in 8) in all conditions in which iodoform is indicated.

Thuja Occidentalis, or Arbor Vitæ (U.S.P.), is an old American remedy, used as a powerful emmenagogue like savin, and as a local remedy for *warts* and *condylomata*. Baratoux, of Paris, has used a tincture (1 in 5) internally in doses of $\frac{1}{2}$ to 1 dr., at the same time applying a spray of 1 in 20, to growths and tumours about the nose, mouth, ear, pharynx and larynx. He claims that this treatment rapidly destroyed all fetor and discharge, and ultimately reduced the vegetations and diminished the size of the new growths. Papilloma of the ear and nose were cured, and epitheliomas were considerably checked in their growth.

Tonga is a preparation consisting of chopped stalks and small quantities of the leaves and inner bark of some plants imported from Fiji; believed to be derived from *Rhaphidophora vitiensis* or *Epipremnum mirabile*, and *Premna taitensis*. From these a liquid is prepared, whose properties have been found to be decidedly antineuralgic. Ringer and Murrell investigated the drug, and found it to speedily cure 6 out of 8 cases of *neuralgia* in which they tried it.

Dose—Of the liquid tonga, 1 dr. three times a day.

Traumaticin corresponds closely with the B.P. solution of Gutta-Percha. (See page 410.)

Tribromophenol, or Bromol, is a new antiseptic introduced by Grimm, who prepares it by agitating a strong solution of carbolic acid with bromine water. It is a powerful germ destroyer, and a 2 per cent. gauze when soaked with the oozing from fresh wounds keeps sweet for a fortnight. It is a white crystalline solid; unfortunately it is insoluble in water, but is soluble in strong solutions of alkalies. Given internally, in doses of $\frac{1}{2}$ to 2 grains, it passes through the stomach unaltered till it reaches the alkaline bile and pancreatic juice, when it dissolves and rapidly enters the blood, being finally eliminated as tribromophenol-sulphuric acid. It has been used as an intestinal disinfectant in *diarrhœa*, *typhoid fever*, and *cholera*.

Trichlorophenol.—See Acid. Trichlorophenic.

Trichloroacetic Acid.—See Acid. Trichloroacetic.

Trimethylamine, or Secalin, is a compound ammonia, obtained by distilling herring brine (or decomposing fish) with lime. It has been found successful in the hands of some in the treatment of *acute rheumatism*, in which disease it has been found to relieve pain, reduce temperature, and diminish the frequency of the pulse.

Its external use as a liniment (1 to 3 of glycerine), applied to the painful joints of *chronic rheumatism*, has given such relief as to warrant its introduction as an anodyne.

Large doses increase the frequency of the pulse, whilst small doses exert a sedative action upon the heart, and act as a stimulating expectorant.

Dose of the hydrochlorate—2 grs. every 2 hours, or 20 minims of the distilled solution (20 per cent.) in peppermint water and sugar, which disguise its fishy taste and smell. This 20 per cent. solution was formerly called in error Propylamine.

Triticum Repens, or Couch Grass—This common grass has been in the hands of some most successfully used in *chronic bladder* ailments. It is a feeble diuretic, and appears (after being tried by some surgeons for a considerable number of years) to possess the virtues claimed for the stigmata of maize. It has fallen into disuse, because the dried grass appears to be almost inert. It is the *fresh rhizome* which should be always used, 2 ozs. boiled in 1 pint water for half an hour, of which a wine-glassful should be taken every 4 or 6 hours.

Tuberculin, or Koch's Lymph, which is a glycerine extract of pure cultivations of the bacilli causing tuberculosis, is still occasionally used as an agent in the treatment of *phthisis* and *lupus*. At present there appears to be such a very strong objection to the use of this substance by the great majority of its former advocates that the writer deems it wise to omit further notice of its action and dosage, but the reader will find upon pages 872 to 879 of his Dictionary of Treatment the whole subject treated in detail, and a scheme laid down for the further use of the agent upon new lines, based on a study of the process of phagocytosis.

Tumenol is a new ichthyol rival. It exists in two forms—the liquid tumenol or tumenol oil which contains tumenol sulphone as well as tumenol sulphonic acid, and the tumenol powder which consists of the acid only. These substances are extracted from mineral oils by strong sulphuric acid, after removal of their phenols and pyrrols by treatment with alkalies. Neisser, who has used these agents in *eczema*, *pruritus*, &c., thinks that they act in an entirely different way from ichthyol; he regards them as reducing agents, the sulphur contained in them only playing a subordinate part. The thick, dark oily liquid mixes well with zinc gelatine.

Turpentine Chian.—See page 529.

Ulexine is a colourless, or yellowish-white, crystalline alkaloid, obtained from the common gorse or furze or whin (*Ulex europæus*) by Mr. Gerrard. It is found, in large doses, to be a powerful respiratory poison and paralysing of the motor nerves. It has a decided diuretic action, and has been given in cases of *dropsy* depending on heart disease, and it is maintained to be much more reliable than Sparteine. At present it is not advisable to

give more than $\frac{1}{12}$ gr. The hydrobromate, which is freely soluble in water, is the salt to be recommended. It has also been advocated as an antidote to strychnine.

Ural, or Uralium, or Chloral-urethane, as its name implies, is a compound of chloral with urethane, existing in the form of colourless, bitter crystals. It is introduced by Bischof and Poppi as an hypnotic, and it is claimed for it to be rapid in its action, and free from unpleasant effects, as the urethane is said to counteract the depressing action of the chloral, but upon the other hand it has been found to reduce the blood pressure. It has been given in doses of 20 to 50 or even 60 grs. in syrup, flavoured with an essential oil to disguise its bitter taste.

Urari.—See Curara, page 535.

Urethane, or Carbamate of Ethylic Ether, is a substance in soluble, white, inodorous crystals, prepared synthetically, and Jaksch has found it to be an hypnotic not followed by any objectionable after consequences. Refreshing sleep was generally induced by about 8 grs. given at bed-time, and repeated in two hours, and sometimes again in two hours more if the effect was not produced. This apparently harmless hypnotic has not fulfilled the expectations raised by the first glowing reports of its virtues. The writer has been invariably disappointed in every instance in which he has used it, though often the dose was 20 grs. It has, however, been recently given in doses of 45–60 grs., but it will probably soon cease to be employed as an hypnotic except in the case of children. It is reported as having been used in *tetanus* with success, and in *strychnine* poisoning.

For Phenyl-urethane—see Euphorin; for Ethyl-chloral-urethane—see Somnal; and for Chloral-urethane—see Ural.

Ustilago Maidis, or Corn Smut, or Corn Ergot (U.S.P.)—The fungus which attacks maize, causing irregular swellings on the young ears, from the size of a pea to that of a foetal head. The blackish, dusty powder in the interior is the part employed. It appears to act like ergot, and it keeps better, and is less expensive, and is coming into favour in America and Canada. Brunton thinks it contains probably the same alkaloid as ergot. It appears, however, to differ from ergot in not producing prolonged contraction of the uterus, but in increasing markedly the rhythmic contractions and relaxations, hence it is more valuable during labour than after (Hubbard).

Dose—1 dr. of the liquid extract (1 in 1).

Verbascum Thapsus (The Mullein Plant)—Quinlan has drawn attention to the usefulness of this plant as a potent remedy for increasing the weight in pulmonary and other wasting diseases. In Ireland its virtues have been long appreciated by the poorer classes in pulmonary complaints, and the original

method of administration, which is that recommended by Quinlan, is to boil 4 oz. of the fresh leaves, or a corresponding quantity of the dry, for 10 minutes in a pint of milk fresh from the cow, to be drunk whilst still warm. This dose should be taken when possible three times a day.

It appears to act like Cod Liver Oil, and it also possesses expectorant properties. The virtue of three pints daily of good milk must very substantially augment the therapeutic action of the mullein plant. The same authority has, however, experimented with this remedy, with and without milk, and is satisfied of its power over the nutrition of the body when given alone, as in the form of succus.

The taste of the plant is objectionable, but milk considerably masks it. The succus can be taken in porter. The young plants resemble those of *digitalis* in appearance.

Relief to *bronchial asthma* and to the hacking *cough* of phthisis has been obtained by smoking the leaves.

Vernonia Nigritiana—This is another new heart poison from the West Coast of Africa, and a member of the Compositæ. A glucoside is obtained from the root, and under the name of Vernonin has been reported upon by several observers, and found to possess properties very similar to digitoxin. Its therapeutic properties have not yet been sufficiently tested to warrant a statement upon its dose or indications, but it has been tried as a febrifuge and cardiac tonic.

Viburnum Opulus (The Snow-Ball Tree)—The dried leaves of this tree were found by Jacobovsky to relieve *angina pectoris*. Dr. Manguby has tried the dry berries with very decided success in a case which resisted a catalogue of remedies, but which does not appear to have been treated with amyl or the nitrites. He prepares an infusion of 2 table-spoonfuls of the berries in water, which he causes to be administered in divided doses during the 24 hours. A fluid extract of the bark (under the name of Cramp Bark) is extensively used as an antispasmodic in colic, hysteria, &c., and has been used in America with considerable benefit in *dysmenorrhœa*, and as a uterine sedative in *menorrhagia* and threatened *abortion*. It appears to closely resemble in its action the following :—

Viburnum Prunifolium, or Black Haw (U.S.P.)—The bark of this tree is in great repute in America ; it possesses properties closely allied to the previous remedy, though there is no published account of its being used in *angina pectoris*. The liquid extract in one drachm doses is given in *dysmenorrhœa*, and as a uterine sedative to prevent contraction of the uterus in the early months of pregnancy, and to cheque *uterine hæmorrhages* and *the vomiting of pregnancy*.

Schatz affirms that in viburnum we have a remedy possessed of virtues owned by no other drug, as it suppresses or reduces the uterine contractions liable to occur in women who have aborted. He insists upon 45 to 60 grs. of the solid extract being given for months.

Viscum Album. (The Mistletoe—See page 574.)

Warburg's Tincture (Tinctura Pyrexialis)—A preparation which has gained for itself a very high reputation in the treatment of pyrexia; it is prepared from a formula published in the *Lancet* of Nov. 13th, 1875. It is undoubtedly of greatest value in *malaria* and other fevers, and in *malarial neuralgia*. It is administered in a table-spoonful dose, after the bowels have been thoroughly emptied; no drink being permitted; it is repeated again in 3 hours, after which profuse aromatic perspiration and a marked fall of temperature set in, with rapid convalescence. It is very useful in several forms of *collapse*.

Its power does not appear to lie in its quinine, camphor, aloes, rhubarb, or opium, but in some of the *aromatic* plants contained in it.

Zea Mays—Stigmata Maidis (Stigmata of Maize, or Corn Silk)—The stigmata or green pistils of *Zea mays*—Indian corn—have been much praised in America as possessing specific or alterative action upon the bladder and genito-urinary tract. It appears to be most active when prepared *fresh*, and good results have followed its use in *cystitis*. It is a diuretic of the mildest and least irritating type. In the *nocturnal incontinence* of urine it has been tried with benefit, and it has been given with success in the later stages of *gonorrhœa*.

Dr. St. George has obtained excellent results with the liquid extract of maize stigmata in cases of *catarrh of the bladder*, and in one case where the ureter was inflamed, this remedy "relieved pain and suppressed discharge as if by magic." He has also found it to diminish the anasarca and to increase the urine in *cardiac dropsy*.

Many observers have reported favourably of this drug in cases of *renal calculi*, and *catarrh of the bladder*, and *pelvis of the kidney*.

Dupont has examined its pharmacology, and found that it possesses properties which place it amongst the first of remedies as a diuretic and cardiac tonic, like digitalis. He found that the extract was well tolerated, that it increased the urine from 20 to 80 ozs. sometimes. He believes it to be specially indicated in *heart diseases with much dropsy*. It acted more speedily than digitalis; it reduced the pulse rate and increased the heart's strength. 20 grs. of the extract were given three or four times daily.

1 dr. of the liquid extract (1 in 1) may be given three times a day; Shoemaker combines it with digitalis and taraxacum.

B.P.C. FORMULÆ.

1892.

THE British Pharmaceutical Conference, in 1886, appointed a Committee to prepare a Formulary of Unofficial Remedies. The following is a brief summary of their results, which are likely to be incorporated in the next issue of the B.P. Physicians are requested in ordering any of the formulæ to add the letters B.P.C. (British Pharmaceutical Conference).

Acidum Hydrocyanicum (Scheele). 4 per cent.

This is prussic acid of double the B.P. strength, since it contains 4 per cent. of HCN. It is prepared by the B.P. process. Dose—1 to 4 minims.

Acidum Hypophosphorosum. 30 per cent.

Prepared by adding H_2SO_4 to a hot solution of hypophosphite of barium, filtering, and evaporating the filtrate till the S.G. 1.1367 is reached. Dose—2 to 5 minims.

Chloral Cum Camphora. 1 in 2.

Prepared by rubbing 1 oz. camphor and 1 oz. hydrate of chloral in a warm mortar till liquefied.

Chloroformum Aconiti. 1 in 1½.

Aconite root 20 oz., after maceration with 1½ oz. stronger solution of ammonia and 20 oz. distilled water, is dried and powdered, and finally percolated with 30 oz. chloroform.

Chloroformum Belladonnæ. 1 in 1½.

Prepared as chloroform of aconite by substituting belladonna root for aconite.

Chloroformum Camphoratum. 2 in 1.

2 oz. camphor dissolved in 1 oz. chloroform.

Collodium Belladonnæ. 1 in 4. (Synonym—Emp. Belladonnæ Fluidum.)

Prepared by dissolving 5 oz. alcoholic extract of belladonna in 2½ oz. spirit of camphor, and adding flexible collodion to 20 oz.

Elixir Cascara Sagrada. 1 in 2½.

Tincture of fresh orange peel 2 oz., rectified spirit 1 oz., cinnamon water 3 oz., syrup 6 oz., and liquid extract of cascara sagrada 8 oz., mixed. Dose—15 minims to 2 drs.

Elixir Glusidi. 3 grs. in 1 dr.

Saccharin 480 grs., bicarbonate of sodium 240 grs., and distilled water 10 oz., dissolve, and add rectified spirit 2½ oz., filter, and wash the filter with q.s. water to measure 20 oz. Dose—5 to 20 minims.

Elixir Guaranæ. I in 5.

Guarana in No. 60 powder, 4 oz., mixed with light magnesia $\frac{1}{2}$ oz. and proof spirit 3 oz., is macerated for 24 hours, mixed with 8 oz. sand and pereolated with proof spirit till 16 oz. are obtained and the residue pressed. To the pereolate add oil of cinnamon 6 minims and 2 oz. syrup, and make up to 20 oz. by addition of the expressed liquid. Dose— $\frac{1}{2}$ to 2 drs.

Elixir Phosphori. $\frac{1}{50}$ gr. in 1 dr.

Compound tincture of phosphorus 4 oz., mixed with glycerine 16 oz. Dose—15 to 60 minims.

Elixir Rhei. I in 4.

5 oz. rhubarb and 2 oz. fennel are repeatedly exhausted with spirit and water (1 and 3) q.s., to the resulting tincture 3 oz. glycerine and 4 oz. sugar are added, and the whole made to measure 20 oz. Dose—1 to 3 drs.

Elixir Sennæ. I in 1 $\frac{1}{2}$.

Prepared by repeated exhaustion of 16 oz. senna by rectified spirit and water, till 16 oz. of product be obtained; this is heated with 12 oz. sugar, and when cold, 24 minims chloroform and 2 $\frac{1}{2}$ minims oil of eoriander, $\frac{1}{2}$ dr. tincture of capsicum, and 3 drs. rectified spirit, are added, and the product made to measure 24 oz. Dose—1 to 3 drs.

Elixir Simplex.

Oil of bitter orange 30 minims, dissolved in rectified spirit 6 oz., and added to distilled cinnamon water 7 oz. and syrup 7 oz., and filtered till bright through paper well sprinkled with kaolin.

Emulsio Olei Morrhuæ. I in 2.

Cod liver oil 8 oz., yolks of 2 eggs, powdered tragacanth 16 grs., elixir of saccharin 1 dr., simple tincture of benzoin 1 dr., spirit of chloroform 4 drs., essential oil of bitter almonds 8 minims, distilled water to 16 oz. Triturate the tragacanth with a little of the oil, add the yolks and stir, gradually adding water and oil alternately; transfer to a pint bottle, adding the remaining ingredients previously mixed together, shake well and make up to 16 oz. Dose 2 to 8 drachms.

Extractum Grindeliæ Liquidum. I in 1.

Prepared by exhausting 20 oz. grindelia, in No. 20 powder, with spirit, reserving the first 17 oz. and distilling the spirit from the remainder, dissolving the resulting extract in the first liquid, and making up with spirit to 20 oz. Dose—10 to 30 minims.

Extractum Hæmatoxyli Liquidum. I in 1.

Prepared by exhausting 20 oz. unfermented logwood by repeated boilings in water, and evaporating the resulting decoction to 20 oz., and decanting after 7 days. Dose $\frac{1}{2}$ to 2 drachms.

Extractum Tritici Liquidum. I in 2.

Prepared by exhausting 10 oz. tritium rhizome in No. 20 powder (gathered in Spring, and rootlets rejected), with boiling water, in a pereolator, evaporating the liquid to 15 oz., adding 5 oz. spirit, and after 48 hours, filtering, and making up to 20 oz. with spirit and water (1 to 3). Dose—1 to 6 drachms.

Glycerinum Belladonnæ. I in 2.

1 oz. extract of belladonna rubbed in a warm mortar with 1 dr. boiling water, and glycerine added to make the product measure 2 fluid oz.

Injectio Curare Hypodermica. 1 in 12.

Curare 5 grs. made into a paste with water and thrown into a funnel plugged with absorbent wool, and water poured upon it till 1 dr. is obtained. Dose—1 to 6 minims.

Linimentum Opii Ammoniatum. 9·9 grs. per oz.

Prepared by mixing and filtering after standing 7 days, tincture of opium 6 oz., liniment of soap 6 oz., liniment of belladonna 1 oz., compound camphor liniment 6 oz., and stronger solution of ammonia 1 oz.

Liquor Ferri Hypophosphitis Fortis. 5 grs. in 1 dr.

Prepared by mixing solutions of sulphate of iron (760 grs. in 5 oz.) and hypophosphite of barium (830 grs. in 15 oz.), shaking and adding 100 minims of diluted sulphuric acid, and syphoning off the clear liquid. Dose—10 to 30 minims.

Liquor Hypophosphitum Compositus. (Syn.—Liq. Ferri Hypophosph. Co.)

Prepared by dissolving in 12 oz. water, hypophosphites of calcium 320 grs., of sodium 320 grs., and of magnesium 160 grs., and adding 6 oz. of last preparation and $\frac{1}{2}$ oz. hypophosphorous acid (30 per cent.)

1 dr. contains 2 grs. each of hypophosphites of sodium and calcium, and 1 gr. of magnesium and $1\frac{1}{2}$ gr. of iron. Dose $\frac{1}{2}$ to 2 drs.

Liquor Picis Carbonis. 1 to 5.

Prepared by percolating 2 oz. quillaia bark in No. 20 powder, with 20 oz. spirit, and adding to the resulting tincture 4 oz. prepared coal tar, digesting at 120° F. for 2 days, decanting or filtering.

Pix Carbonis Liquida Præparata.

Place commercial coal tar in a shallow vessel, heat at 120° F. for 1 hour, stirring frequently.

Syrupus Apomorphinæ Hydrochloratis. 1 dr. contains $\frac{1}{32}$ gr.

Dissolve 5 grs. hydrochlorate of apomorphine in 7 drs. water and 7 drs. spirit, add 2 drs. diluted hydrochloric acid and 18 oz. syrup. Dose $\frac{1}{2}$ to 1 dr.

Syrupus Butyl-Chloral. 1 dr. contains 2 grs.

320 grs. hydrate of butyl-chloral dissolved in q.s. syrup to make 20 oz. Dose—1 to 4 drs.

Syrupus Calcii Hypophosphitis. 1 gr. in 1 dr.

Prepared by dissolving 160 grs. hypophosphite of calcium in 9 oz. distilled water, filtering and adding 16 oz. sugar, and, after cooling, adding 20 minims hypophosphorous acid and distilled water to 20 oz. Dose—1 to 4 drs.

Syrupus Cascara Sagrada. 1 in 5.

Prepared by mixing 4 oz. liquid extract of cascara sagrada, 3 oz. liquid extract of liquorice, 2 drs. carminative tincture and syrup q.s. to make 20 oz. Dose—1 to 4 drs.

Syrupus Codeinæ. 1 gr. in 1 oz.

Prepared by dissolving 20 grs. codeine in $1\frac{1}{4}$ oz. proof spirit and $1\frac{1}{4}$ oz. water, and syrup q.s. to make 20 oz. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ferri Bromidi. 1 dr. contains $4\frac{1}{2}$ grs. Bromide of Iron.

Prepared by shaking $\frac{1}{2}$ oz. iron wire, free from oxide, with 533 grs. bromine and 4 oz. water, and filtering the liquid into a hot syrup composed of sugar 14 oz., and water 6 oz. Dose— $\frac{1}{2}$ to 1 dr.

Elixir Guaranæ. I in 5.

Guarana in No. 60 powder, 4 oz., mixed with light magnesia $\frac{1}{2}$ oz. and proof spirit 3 oz., is macerated for 24 hours, mixed with 8 oz. sand and percolated with proof spirit till 16 oz. are obtained and the residue pressed. To the percolate add oil of cinnamon 6 minims and 2 oz. syrup, and make up to 20 oz. by addition of the expressed liquid. Dose— $\frac{1}{2}$ to 2 drs.

Elixir Phosphori. $\frac{1}{50}$ gr. in 1 dr.

Compound tincture of phosphorus 4 oz., mixed with glycerine 16 oz. Dose—15 to 60 minims.

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5 oz. rhubarb and 2 oz. fennel are repeatedly exhausted with spirit and water (1 and 3) q.s., to the resulting tincture 3 oz. glycerine and 4 oz. sugar are added, and the whole made to measure 20 oz. Dose—1 to 3 drs.

Elixir Sennæ. I in 1 $\frac{1}{2}$.

Prepared by repeated exhaustion of 16 oz. senna by rectified spirit and water, till 16 oz. of product be obtained; this is heated with 12 oz. sugar, and when cold, 24 minims chloroform and 2 $\frac{1}{2}$ minims oil of coriander, $\frac{1}{2}$ dr. tincture of capsicum, and 3 drs. rectified spirit, are added, and the product made to measure 24 oz. Dose—1 to 3 drs.

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Emulsio Olei Morrhuæ. I in 2.

Cod liver oil 8 oz., yolks of 2 eggs, powdered tragacanth 16 grs., elixir of saccharin 1 dr., simple tincture of benzoin 1 dr., spirit of chloroform 4 drs., essential oil of bitter almonds 8 minims, distilled water to 16 oz. Triturate the tragacanth with a little of the oil, add the yolks and stir, gradually adding water and oil alternately; transfer to a pint bottle, adding the remaining ingredients previously mixed together, shake well and make up to 16 oz. Dose 2 to 8 drachms.

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Prepared by exhausting 20 oz. grindelia, in No. 20 powder, with spirit, reserving the first 17 oz. and distilling the spirit from the remainder, dissolving the resulting extract in the first liquid, and making up with spirit to 20 oz. Dose—10 to 30 minims.

Extractum Hæmatoxyli Liquidum. I in 1.

Prepared by exhausting 20 oz. unfermented logwood by repeated boilings in water, and evaporating the resulting decoction to 20 oz., and decanting after 7 days. Dose $\frac{1}{2}$ to 2 drachms.

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Prepared by exhausting 10 oz. triticum rhizome in No. 20 powder (gathered in Spring, and rootlets rejected), with boiling water, in a percolator, evaporating the liquid to 15 oz., adding 5 oz. spirit, and after 48 hours, filtering, and making up to 20 oz. with spirit and water (1 to 3). Dose—1 to 6 drachms.

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1 oz. extract of belladonna rubbed in a warm mortar with 1 dr. boiling water, and glycerine added to make the product measure 2 fluid oz.

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Curare 5 grs. made into a paste with water and thrown into a funnel plugged with absorbent wool, and water poured upon it till 1 dr. is obtained. Dose—1 to 6 minims.

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Prepared by mixing and filtering after standing 7 days, tincture of opium 6 oz., liniment of soap 6 oz., liniment of belladonna 1 oz., compound camphor liniment 6 oz., and stronger solution of ammonia 1 oz.

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1 dr. contains 2 grs. each of hypophosphites of sodium and calcium, and 1 gr. of magnesium and $1\frac{1}{2}$ gr. of iron. Dose $\frac{1}{2}$ to 2 drs.

Liquor Picis Carbonis. 1 to 5.

Prepared by pereolating 2 oz. quillaia bark in No. 20 powder, with 20 oz. spirit, and adding to the resulting tincture 4 oz. prepared coal tar, digesting at 120° F. for 2 days, decanting or filtering.

Pix Carbonis Liquida Præparata.

Place commercial coal tar in a shallow vessel, heat at 120° F. for 1 hour, stirring frequently.

Syrupus Apomorphinæ Hydrochloratis. 1 dr. contains $\frac{1}{3}\frac{1}{2}$ gr.

Dissolve 5 grs. hydrochlorate of apomorphine in 7 drs. water and 7 drs. spirit, add 2 drs. diluted hydrochloric acid and 18 oz. syrup. Dose $\frac{1}{2}$ to 1 dr.

Syrupus Butyl-Chloral. 1 dr. contains 2 grs.

320 grs. hydrate of butyl-chloral dissolved in q.s. syrup to make 20 oz. Dose—1 to 4 drs.

Syrupus Calcii Hypophosphitis. 1 gr. in 1 dr.

Prepared by dissolving 160 grs. hypophosphite of calcium in 9 oz. distilled water, filtering and adding 16 oz. sugar, and, after cooling, adding 20 minims hypophosphorous acid and distilled water to 20 oz. Dose—1 to 4 drs.

Syrupus Cascara Sagrada. 1 in 5.

Prepared by mixing 4 oz. liquid extract of cascara sagrada, 3 oz. liquid extract of liquorice, 2 drs. carminative tincture and syrup q.s. to make 20 oz. Dose—1 to 4 drs.

Syrupus Codeinæ. 1 gr. in 1 oz.

Prepared by dissolving 20 grs. codeine in $1\frac{1}{4}$ oz. proof spirit and $1\frac{1}{4}$ oz. water, and syrup q.s. to make 20 oz. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ferri Bromidi. 1 dr. contains $4\frac{1}{2}$ grs. Bromide of Iron.

Prepared by shaking $\frac{1}{2}$ oz. iron wire, free from oxide, with 533 grs. bromine and 4 oz. water, and filtering the liquid into a hot syrup composed of sugar 14 oz., and water 6 oz. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri Hypophosphitis. 1 gr. in each dr.

Prepared by mixing 4 oz. strong solution of hypophosphite of iron with 16 oz. syrup. Dose $\frac{1}{2}$ to 2 drs.

Syrupus Ferri Phosphatis Compositus.

Prepared by dissolving $37\frac{1}{2}$ grs. iron wire, free from oxide, in 1 oz. concentrated phosphoric acid and 5 drs. water, and, when cold, adding to a solution of 120 grs. precipitated carbonate of calcium in 4 drs. concentrated phosphoric acid, and 2 oz. water; after mixing, add 9 grs. bicarbonate of potassium and 9 grs. phosphate of sodium, filter and add a filtered decoction of 30 grs. cochineal in 7 oz. water in which 14 oz. sugar have been dissolved and add q.s. water to 20 oz. Each dr. contains $\frac{1}{2}$ gr. phosphate of iron and 4-5th gr. phosphate of calcium. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ferri et Quininæ Hydrobromatum.

Prepared by dissolving 160 grs. acid hydrobromate of quinine in 1 oz. water and 1 oz. diluted hydrobromic acid, and adding syrup of bromide of iron to 20 oz. Each dr. contains 1 gr. acid hydrobromate of quinine and 4 grs. bromide of iron. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri Quininæ et Strychninæ Hydrobromatum.

Prepared by dissolving $2\frac{1}{2}$ grs. strychnine and 160 grs. acid hydrobromate of quinine in 1 oz. water and 1 oz. diluted hydrobromic acid, and adding syrup of bromide of iron to 20 oz. Each dr. contains 1-64th grain strychnine, 1 grain acid hydrobromate of quinine, and 4 grs. bromide of iron. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Ferri, Quininæ et Strychninæ Phosphatum.

Prepared by dissolving 5 grs. strychnine in 225 minims of water and 75 minims concentrated phosphoric acid, and adding 120 grs. phosphate of quinine, and after solution, making up with syrup of phosphate of iron to 20 oz. Each dr. contains 1 gr. phosphate of iron, $\frac{3}{4}$ gr. phosphate of quinine, and 1-32 gr. strychnine. Dose— $\frac{1}{2}$ to 1 dr.

Syrupus Hypophosphitum Compositus.

Prepared by dissolving 20 grs. quinine (alkaloid) and 1 gr. strychnine in 2 drs. of 30 per cent. hypophosphorous acid and 3 oz. strong solution of hypophosphite of iron, in this dissolving 80 grs. hypophosphite of calcium and 40 grs. each hypophosphites of manganese and potassium, and making up with syrup to 20 oz. Each dr. contains 1-160th grain strychnine and $\frac{1}{8}$ grain quinine. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Ipecacuanhæ Aceticus. 1 in 42.

Prepared by dissolving $2\frac{1}{4}$ lbs. sugar in 20 oz. vinegar of ipecacuanha. Dose— $\frac{1}{4}$ to 2 drs.

Syrupus Pruni Virginianæ. 1 in 7 nearly.

Prepared by exhausting 3 oz. wild cherry bark in No. 20 powder with 9 oz. water, adding 15 oz. sugar and $1\frac{1}{4}$ oz. glycerine and q.s. water to 20 oz. Dose— $\frac{1}{2}$ to 2 drs.

Syrupus Sodii Hypophosphitis. 1 gr. in 1 dr.

Prepared by dissolving 160 grs. hypophosphite of soda in 3 drs. water, filtering, and washing the filter with 1 dr. water, and adding q.s. syrup to measure 20 oz. Dose—1 to 4 drs.

Tinctura Benzoini Simplex. 1 in 10.

Prepared by macerating 2 oz. benzoin in 20 oz. rectified spirit, and filtering.

Tinctura Bryoniæ. 1 in 10.

Prepared from *fresh* bryony root by calculating the moisture contained in it, and producing a proof spirit tincture by maceration for seven days of such a strength as that 10 oz. shall represent 1 oz. of *dried* root. Dose—1 to 10 minims.

Tinctura Calendulæ Florum. 1 in 5.

Prepared by macerating and percolating 4 oz. dried marigold flowers with 20 oz. proof spirit. Dose—5 to 20 minims.

Tinctura Capsici Fortior. 1 in 3.

Prepared by macerating and percolating 10 oz. capsicum fruit in No. 40 powder with 30 oz. spirit. Dose—1 to 3 minims.

Tinctura Carminativa.

Prepared by macerating 600 grs. bruised cardamom seeds in 15 oz. spirit for 7 days, and adding to the resulting tincture $1\frac{1}{4}$ oz. stronger tincture of ginger and 100 minims each of oils of cinnamon, caraway, and clove, and making up with spirit to 20 oz. Dose—2 to 10 minims.

Tinctura Convallariæ. 1 in 8.

Prepared by macerating and percolating $2\frac{1}{2}$ oz. lily of the valley flowers and stalks dried, in No. 20 powder, with 20 oz. proof spirit. Dose—5 to 20 minims.

Tinctura Coto. 1 in 10.

Prepared by macerating 2 oz. bruised coto bark in 20 oz. rectified spirit for 7 days. Dose—10 to 30 minims.

Tinctura Ergotæ Ammoniata. 1 in 2.

Prepared by macerating and percolating 10 oz. ergot in No. 20 powder with 20 oz. aromatic spirit of ammonia. Dose—10 to 60 minims.

Tinctura Erythrophlæi. 1 in 10.

Prepared by macerating and percolating 2 oz. casca bark in No. 20 powder with 20 oz. rectified spirit. Dose—5 to 10 minims.

Tinctura Eucalypti. 1 in 5.

Prepared by macerating and percolating 4 oz. eucalyptus leaves in No. 20 powder with 20 oz. rectified spirit. Dose—15 minims to 2 drachms.

Tinctura Euonymi. 1 in 5.

Prepared by macerating and percolating 4 oz. euonymus bark in No. 20 powder with 20 oz. rectified spirit. Dose—10 to 40 minims.

Tinctura Euphorbiæ Piluliferæ. 1 in 5.

Prepared by macerating and percolating 4 oz. euphorbia bark in No. 20 powder with 20 oz. proof spirit. Dose—10 to 30 minims.

Tinctura Iodi Decolorata. $12\frac{1}{2}$ grs. to 1 oz.

Prepared by dissolving 250 grs. iodine, in $5\frac{1}{2}$ oz. rectified spirit, and adding 10 drs. stronger solution of ammonia. After decolorisation, dilute with rectified spirit q.s. to measure 20 oz.

~~125~~ Before dilution the preparation may be prescribed as Tinctura Iodi Decolorata Fortior.

Tinctura Phosphori Composita. $\frac{1}{10}$ gr. in 1 dr.

Prepared by dissolving 12 grs. phosphorus in $2\frac{1}{2}$ oz. chloroform and adding $12\frac{1}{2}$ oz. ethylic alcohol. Dose—3 to 12 minims.

Tinctura Pruni Virginianæ. 1 in 5.

Prepared by macerating 4 oz. wild cherry bark in No. 20 powder in $7\frac{1}{2}$ oz. water, for 24 hours, adding $12\frac{1}{2}$ oz. rectified spirit, macerating for 7 days, and after pressing and filtering, making the tincture up to 20 oz. with proof spirit. Dose—20 to 60 minims.

Unguentum Hydrargyri Oleati. 1 in 2.

Prepared by mixing, without heat, equal weights of simple ointment and oleate of mercury.

Unguentum Oleo-Resinæ Capsici. 1 in $5\frac{1}{2}$.

Prepared by adding 1 oz. oleo-resin of capsicum, to a melted mixture of $\frac{1}{2}$ oz. yellow wax and 4 oz. benzoated lard. As a mild counter-irritant, this ointment will bear dilution from 3 to 6 times.

Vinum Aurantii Detannatum.

Prepared by macerating 2 oz. gelatine (cut small) with 1 gallon orange wine for 14 days, and decanting.

Vinum Xericum Detannatum.

Prepared by macerating 2 oz. gelatine (cut small) in 1 gallon sherry for 14 days, and decanting.

INDEX

OF

POISONS AND THEIR ANTIDOTES.

(From the Author's Dictionary of Treatment, page 697.)

POISONING.—In the treatment of poisoning, the first consideration in the great majority of cases will be to evacuate the contents of the stomach when this is possible. This may be accomplished by emetics or by the stomach-pump, or by tickling the fauces when these agents are not at hand. In poisoning by the strong mineral acids and all corrosive substances the stomach-pump is contra-indicated, but in the case of corrosive substances like carbolic acid it may be used cautiously if a soft tube be employed. Indeed, the soft India-rubber tube of the stomach-pump can scarcely do any harm except in the instances of most destructive poisoning by concentrated sulphuric or nitric acid, and the pump should always be fitted with such a tube in at least two sizes. When at hand, the pump should be preferred to every other means of emptying the stomach, and except in the limited number of cases just mentioned, it may be used even when there is room for considerable doubt in the diagnosis of poisoning in patients found in insensible or comatose conditions. The coroner's court will justly censure the practitioner who has been in attendance upon a patient picked up in an insensible condition if the evidence afterwards produced proves that a narcotic poison had been swallowed, though when seen by the physician no such evidence had been forthcoming, and the symptoms pointed to head injury, uræmia, or apoplexy. The cautious use of the pump with the rubber tube, when scientifically carried out, can in no way injure the patient's chances of recovery should the case ultimately turn out not to be one of poisoning; and as every minute's delay may be serious for the patient, and as there is thus short time for counsel and debate, he should be prepared to act accordingly and make his error upon the safe side.

The first time of using the stomach-pump is sure to be a bungling affair if the operator feels timorous or nervous. The tongue being depressed by the left index finger as the patient is seated in a chair, with the head well steadied by an assistant, and the gag in position, the tube is to be pushed steadily, boldly, and rapidly through the mouth, pharynx, and œsophagus till the stomach is reached. Though it is more difficult to pass the soft rubber tube, the confidence in its perfect harmlessness will be of great importance to the novice. He should not be deterred by the sound which may be produced by air passing through the tube as its extremity glides past the epiglottis, this ceases as the rubber is passed home into the stomach. During the pumping, by reversing the action of the levers, a little water may from time to time be sent into the stomach to clear the tube of any solid obstruction, and before withdrawing it finally, tepid water should be injected into the organ, and this should be pumped out again, the operation being continued till the washings return clear. The antidote may be mixed with the water, and in many instances a quantity of this should be left in the stomach. In pumping opium or alcohol cases, after the washings return clear and free from odour, the stomach may be partially filled with strong infusion of tea or coffee.

The syphon tube may take the place of the stomach-pump in most cases.

30 grains of sulphate of zinc or 10 grains of sulphate of copper in a tumblerful of tepid water will prove efficient emetics; and apomorphine, 1-10th grain injected hypodermically, acts with great certainty and rapidity when the patient is unable to swallow. Notice should be taken of the fact that though patients may often take apomorphine in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain by the mouth without experiencing nausea, this dose might prove fatal if given by the hypodermic method, owing to its rapid depressant effect upon the heart.

Mustard in dessert-spoonful doses, in copious quantities of tepid water, may be used when the above emetics are not at hand. Ipecacuanha and antimony are too slow in their action to be depended upon.

The contents of the stomach when ejected (or when obtained afterwards upon opening the body) should be carefully preserved for further investigation. This is often overlooked in the exciting period of treatment.

The writer has several times successfully pumped and washed out the stomachs of infants and very young children with a soft India-rubber male catheter, attached to the nozzle of an ordinary large glass or metal syringe.

The following formula (from the *Pharm. Rundschau*) may be employed as a general antidote for any poison of unknown nature:—

Calcined Magnesia	}	Equal quantities.
Powdered Wood Charcoal		
Hydrous Peroxide of Iron		

Half an ounce of each of these may be given in a tumblerful of water every half hour till three doses be taken.

Acids, Mineral—The stomach-pump should *not* be used. Alkalies—Lime, soap, chalk, potash, soda, or magnesia—moderately diluted with water, may be freely given. In the absence of these, plaster off a wall, oils (almond or olive) and small doses of morphine hypodermically should be administered; all food should be given by the rectum. At a later stage, when the danger of perforation has passed off, bland mucilaginous foods, like barley water, linseed tea, and white of eggs, may be freely given.

Acid, Prussic (or Hydrocyanic)—The stomach, if possible, should be emptied by the stomach-pump or by a rapid emetic ($\frac{1}{2}$ dr. sulphate of zinc). Hypodermic injections of atropine (1-60th gr.); 2 minims of the 1 in 100 solution of atropine may be given, and repeated in 30 minutes if necessary. Ammonia or whiskey, inhalation of oxygen, ammonia, or chlorine, cold and hot affusions alternately, and *artificial respiration*, are the best agents to resort to.

Freshly precipitated oxide of iron, followed by a solution of carbonate of potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Aconite (and Hellebore or Veratrine)—The stomach-pump or emetics should be used: 1-10th gr. apomorphine hypodermically, or a table-spoonful of mustard in warm water, or $\frac{1}{2}$ to 1 dr. sulphate of zinc should be given as soon as possible. Stimulants—whiskey and ammonia hypodermically, with 20 to 30 minims of *tincture of digitalis* or 2 minims liquor atropinæ should be then administered. Strychnine may be given (1-30th gr.) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back, and in a state of absolute rest, and sinapisms applied to the heart and extremities; and dry heat, friction, and artificial respiration kept up unceasingly. Murrell recommends inhalations of nitrite of amyl.

Alcohol—The stomach-pump should be promptly used, and the stomach filled through it with strong coffee, to which a little ammonia should be added; or a hypodermic injection of 5 minims apomorphine solution may be given in the absence of the pump; sinapisms, cold affusion, nitrite of amyl inhalation, or electricity may be tried, and in *desperate* cases, boiling water may be used to cause immediate vesication of the skin over the soles of the feet. The

hypodermic injection of 1-100th to 1-50th gr. strychnine is of unquestionable value, as pointed out by Gibson.

Ammonia and Alkalies—The stomach-pump should *not* be used. Weak acids (acetic preferable) may be given, largely diluted, and followed by draughts of almond or olive oil, or of melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and morphine hypodermically for the shock.

Antimony (Tartar Emetic)—Stomach-pump or emetics are not generally required, as vomiting sets in soon. Tannin, strong tea; or gallic acid, or any diluted astringent tincture or infusion containing tannin, may be freely given, followed up by the hypodermic or rectal administration of alcohol, to which small doses of digitalis or strychnine may be added. White of egg, barley water, or linseed tea may be given freely.

Butter of Antimony—The treatment of poisoning by this preparation of antimony should be the same as for the mineral acids—viz., magnesia, soap suds, chalk, potash, or soda, followed by oil and milk.

Arsenic—The stomach-pump or emetics, or 5 minims of apomorphine injection, should be employed even when vomiting has already taken place. Freshly-prepared moist peroxide of iron (prepared by adding soda or ammonia to the tincture of iron, and filtering rapidly through muslin or cambric) or dialysed iron in ounce doses, diluted, or, in the absence of these, magnesia freely, or animal charcoal, olive oil, or lime water, must be freely given; demulcent drinks and stimulants by mouth or rectum are also indicated. Large doses of castor oil are essential to clear out the intestinal tract and to prevent further absorption.

Atropine and Belladonna—The stomach-pump or emetics, and afterwards the following are to be given—Tannin, charcoal, or tea, morphine ($\frac{1}{2}$ grain) by subcutaneous injection, or laudanum by the mouth, or pilocarpine ($\frac{1}{3}$ grain) subcutaneously, followed by purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist, but pilocarpine is better. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica—The stomach-pump or emetics, especially apomorphine hypodermically (5 minims of B.P. injection), are to be given, and the symptoms treated as they present themselves. It will generally be found necessary to both purge and stimulate.

Camphor—The stomach-pump or emetics, and copious draughts of water, with brisk saline cathartics, and general counter-irritation, or cold and hot douches alternately, afford the best means of dealing with this poison.

Cantharides—Stomach-pump or emetics, mucilaginous drinks, or in their absence, oils, chalk, a little opium by the mouth, and a morphine suppository by the rectum, should be used.

Carbolic Acid—The stomach-pump with its soft rubber tube should be used, after which the organ should be thoroughly washed out with pure glycerine or with solution of Epsom or Glauber's salt. Give oils, egg albumen, and warm mucilaginous drinks, with any soluble sulphate, and finally, freely stimulate, counter-irritate, and inject 1-60th grain of atropine. Though there is no known antidote, the writer—in a case where half a cupful of the strong acid was taken in a fit of drunkenness—after the contents of the stomach were evacuated, washed that organ out repeatedly with pure glycerine, using half a gallon of it, the glycerine dissolving the excess of acid out of the swollen mucous membrane, and the patient made a good recovery. He has since satisfied himself that this is the best treatment whenever the strong acid has been swallowed.

Chloral Hydrate—The stomach-pump or emetics, especially 5 minim injections of apomorphine solution should be used, and these must be followed

by injections of strychnine (1-20th grain), or of atropine (1-25th grain), caffeine (5 grains) or free stimulation with ammonia, whiskey, or ether, and sinapisms, *Particularly external warmth*, electricity, and artificial respiration; inhalation of amyl nitrite may be tried. The patient should be roused and prevented from sleeping, and, as death may occur from the diminution of the body heat, warmth is essential. A pint of strong, warm coffee into the rectum, as advised by Murrell, may save life.

Chlorine, when inhaled, must be treated by inhalations of ammonia or sulphuretted hydrogen. If the poison has been swallowed it should be neutralised by large quantities of albumen and mucilaginous drinks.

Chloroform—When symptoms of an alarming interference with the breathing or circulation come on during anæsthesia, the tongue should be drawn forward, artificial respiration, cold affusion, free ventilation by a current of air, turning over the patient upon his left side, or inversion of the body, may be tried.

Hypodermically—whiskey, ammonia, strychnine, or digitalis, or inhalation of nitrite of amyl, may be given. Galvanism is doubtful. If the chloroform has been swallowed, use the pump, or give 5 minims of apomorphine solution, and proceed as if inhaled.

Colchicum—Stomach-pump or emetics, mucilaginous drinks, albumen, or strong tea or tannin, should be given, and these should be followed by a purgative, after which free stimulation may be required, and symptoms met as they arise.

Conium—The stomach-pump or emetics, tannin, and castor oil should be used. Stimulate freely by ammonia. Hypodermics of strychnine or atropine may be tried, and artificial respiration persevered with.

Copper Salts—The stomach-pump or emetics must be resorted to if free vomiting has not occurred; yellow prussiate of potassium, egg albumen or milk, which form insoluble copper salts, are to be given; mucilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of opium to allay irritation, are called for.

Corrosive Sublimate.—See Mercury.

Creasote—The same treatment may be employed as in poisoning by carbolic acid.

Croton Oil—The general treatment for irritant poisons may be used, viz.:—emetics, or, if in the early stage, the gentle use of the stomach-pump, demulcent drinks, soothing enemata, and opium. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium poisoning is to be treated as if hydrocyanic acid had been swallowed, and if seen at once give solution of ferri sulph., and alternate hot and cold douche, whilst atropine is given by hypodermic injection.

Digitalis—The stomach-pump or emetics, especially sulphate of zinc, $\frac{1}{2}$ drachm, or 5 minims of apomorphine solution hypodermically, tannin, or animal charcoal, free stimulation and the hypodermic injection of 1-120th gr. aconitine, and the free use of opium are required. Muscarin ($\frac{1}{3}$ gr.) is antagonistic, and alcohol should be given.

The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium—Emetics or the stomach-pump must be used. Demulcent drinks and opium are to be administered freely, and the general treatment of the symptoms of gastro-intestinal irritation is to be followed.

Eserine, or Calabar Bean—Emetics or the pump, with tannin or any tannin-containing liquid, may be employed, but hypodermic injections of atropine (1-30th gr.), till the pupils widely dilate, afford the best chance. Strychnine and chloral have been recommended.

Artificial respiration should be assiduously tried, with friction and warmth externally.

Ether (Inhalation)—Pull forward the tongue, give free current of air, commence artificial respiration, and treat as if chloroform poisoning.

Fungi, or Muscarin—Emetics or the pump should be used, and atropine given hypodermically (1-60th gr.) and repeated till the pupils dilate, or digitalis or morphine, may be given. Free stimulation, sinapisms, and friction may be required.

The writer has had to treat a large school of children who had eaten fungi. Many were very bad, and about six of them appeared to be dying when first seen. Atropine appeared to act like magic, and all made a good recovery.

Gelsemium—The stomach-pump and emetics are to be used, and bicarbonate of potassium and tannin freely given; warmth, free stimulation with alcohol, electricity, and artificial respiration are to be kept up.

Hypodermics of ammonia or atropine, or digitalis, are partially antagonistic. The best result will follow 3 minims of atropine solution.

Hydrocyanic Acid (Prussic Acid)—Antidote and treatment are described under Acid Prussic.

Hyoscyamus.—Same as for atropine.

Iodine—Emetics or the *cautious* use of the rubber tube of the stomach-pump should be employed, together with the free administration of starch, arrowroot, bread, boiled potatoes, flour, lime water, and demulcent drinks.

Laburnum—The stomach-pump if possible, should be always used, even if vomiting has occurred, as portions of seeds &c., may remain in the stomach. Free stimulation, and, in bad cases, hypodermic injection of ammonia. Counter-irritation, friction, and the cold douche are necessary.

Lead Salts—The stomach-pump, or, preferably, a large emetic of sulphate of zinc, which is also an antidote, should be given, and followed by milk, white of egg, diluted sulphuric acid, Epsom or Glauber's salts, or phosphate of sodium, sulphuretted hydrogen, or Harrowgate water. Demulcent drinks, with mild opiates to allay pain and spasm, may be administered. (See also under Plumbism.)

Lime—Carbonic acid—any ærated water, as soda water or lemonade—is very useful; or weak acetic acid or vinegar, freely diluted, and followed by oil or demulcent drinks, may be swallowed.

Lobelia (or Tobacco)—Emetics or the pump should be employed, as should also tannin, and free stimulation externally by sinapisms, friction, and dry heat, internally or hypodermically by alcohol, ammonia, and ether, with strychnine (1-30th gr.), and small doses of opium. The patient must be kept strictly in the horizontal position.

Mercury (Corrosive Sublimate)—Emetics, or the very cautious use of the pump will be required. (The pump should not be used except in the very early stages of the poisoning.) Albumen or gluten (prepared by washing flour in a muslin bag), demulcent drinks, milk, and oil are to be given by the mouth, and morphine and alcohol, subcutaneously.

Morphine.—See Opium.

Muscarin (or Mushrooms)—Same treatment as in poisoning by Fungi, viz., the subcutaneous administration of atropine after the use of an emetic or the pump.

Nux Vomica.—See strychnine.

Opium (or Morphine)—The stomach-pump, or in its absence, emetics (if capable of swallowing), must be resorted to, or 1-10th to 1-5th grain of apomorphine injected hypodermically. The stomach should be washed out with tepid water, and filled with strong coffee, or tea or any infusion or liquid containing tannin.

Caffeine, atropine, or strychnine hypodermically, is to be administered. This latter should be repeated frequently as long as there are dangerous cardiac or respiratory symptoms; 1-75th grain may be given every 2 or 3 hours. Flagellations, cold and hot affusions alternately, electricity, extensive sinapisms, or very hot water, to cause vesication in desperate cases, must be employed to rouse the patient, and when once aroused he should never be allowed to fall.

asleep again, but should be kept continually on the move, though every care must be exercised lest this should be carried too far so as to induce exhaustion, as is, unfortunately, often done. Artificial respiration may be required.

Nitric Acid.—See under Acids, Mineral.

Oxalic Acid—The pump or emetics must be used. Lime (lime water, putty of lime, or chalk) is the best antidote; one good dose of castor oil, counter-irritation, free stimulation, and the treatment for gastro-enteric inflammation should be followed.

Pilocarpine—The stomach-pump or emetics will be required, together with the free administration of tannin and the hypodermic use of its antagonist—atropine—in 1-40th to 1-20th grain doses.

Phosphorus—The pump or emetics will be necessary. Sulphate of copper 5 grains every 15 minutes, is both antidote and emetic. French oil of turpentine or any old oil of turpentine, purgatives, and demulcent drinks containing magnesia and albumen should be swallowed. Oils and butter should be avoided.

Physostigma.—See under Eserine.

Potash (Caustic)—Emetics must be administered. The pump should *not* be used. Weak acids (vegetable preferred, and largely diluted), oils, and butter may be freely administered. The after-treatment will consist in rectal feeding, and after the danger of perforation has passed away, the free use of barley water, linseed tea, and other demulcents.

Potassium Chlorate—The pump or emetics and profuse demulcent drinks and purgatives are indicated, along with hot blanket baths and the treatment for acute Bright's disease.

Silver Nitrate (or Lunar Caustic)—Large doses of common salt or sea water should be swallowed. Emetics and the pump (India-rubber tube) should be used, and white of egg injected into the stomach after the poison is removed. Yolk of egg, wheaten flour, or milk mixed with water should be freely administered.

Soda (Caustic)—Acids and oils will be required (as for potash).

Stramonium—Emetics, tannin, free stimulation, and hypodermic use of morphine are the necessary treatment (same as for atropine and belladonna).

Strychnine—The pump or emetics, especially a hypodermic injection of 1-10th to 1-5th grain apomorphine, must be given, followed by charcoal or tannin in large quantities. Tobacco by rectum (with great caution—not more than 20 grains at once), bromide of potassium in large doses (2 drs. to 2 oz.), chloral, chloroform, calabar bean, conium, morphine, ether, &c., are recommended. The writer believes that poisonous doses of *alcohol* afford the best treatment, given both by mouth and rectum. Artificial respiration may be tried. Chloroform inhalation may be kept up as long as the convulsions are severe.

Sugar of Lead—Sulphate of zinc, albumen, &c. (See Lead.)

Sulphurets and Sulphuretted Hydrogen—Inhalation of air containing a small percentage of chlorine in it, and the free administration of a very weak solution of chlorinated lime or soda, constitute the necessary treatment.

Sulphuric Acid.—See under Acids, Mineral.

Tartar Emetic—Tannin, green tea, &c. (See Antimony.)

Tobacco—Emetics, tannin, free stimulation, and hypodermic injection of strychnine (1-20th grain) are indicated, and the recumbent position must be strictly maintained (as for Lobelia).

Veratrine—The pump or emetics must be used, followed by alcohol, opium, &c., as for Aconite (which see).

Zinc Salts (chiefly the Chloride, as Burnett's Fluid)—The rubber tube of the stomach-pump should be used with caution, or emetics, especially apomorphine, 1-10th grain, may be injected hypodermically. Egg albumen, tea, tannin, milk, alkalies or their carbonates, demulcent drinks, and soothing enemata containing a little laudanum, are to be administered.

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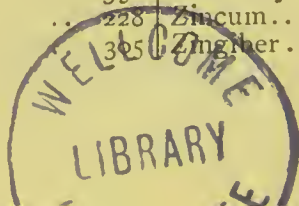
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CROWN OCTAVO, CLOTH, PP. 1,000. 16/-. 1892.

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℞
 liq. Arsenicalis m̄v.
 Tr. Gelsemii m x.
 liq. Triclitrii m $\frac{1}{2}$
 Sp. Chlor of. 3i
 Aquam ad ℞ss

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